A Hitchcock Publication

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JUNE, 1951

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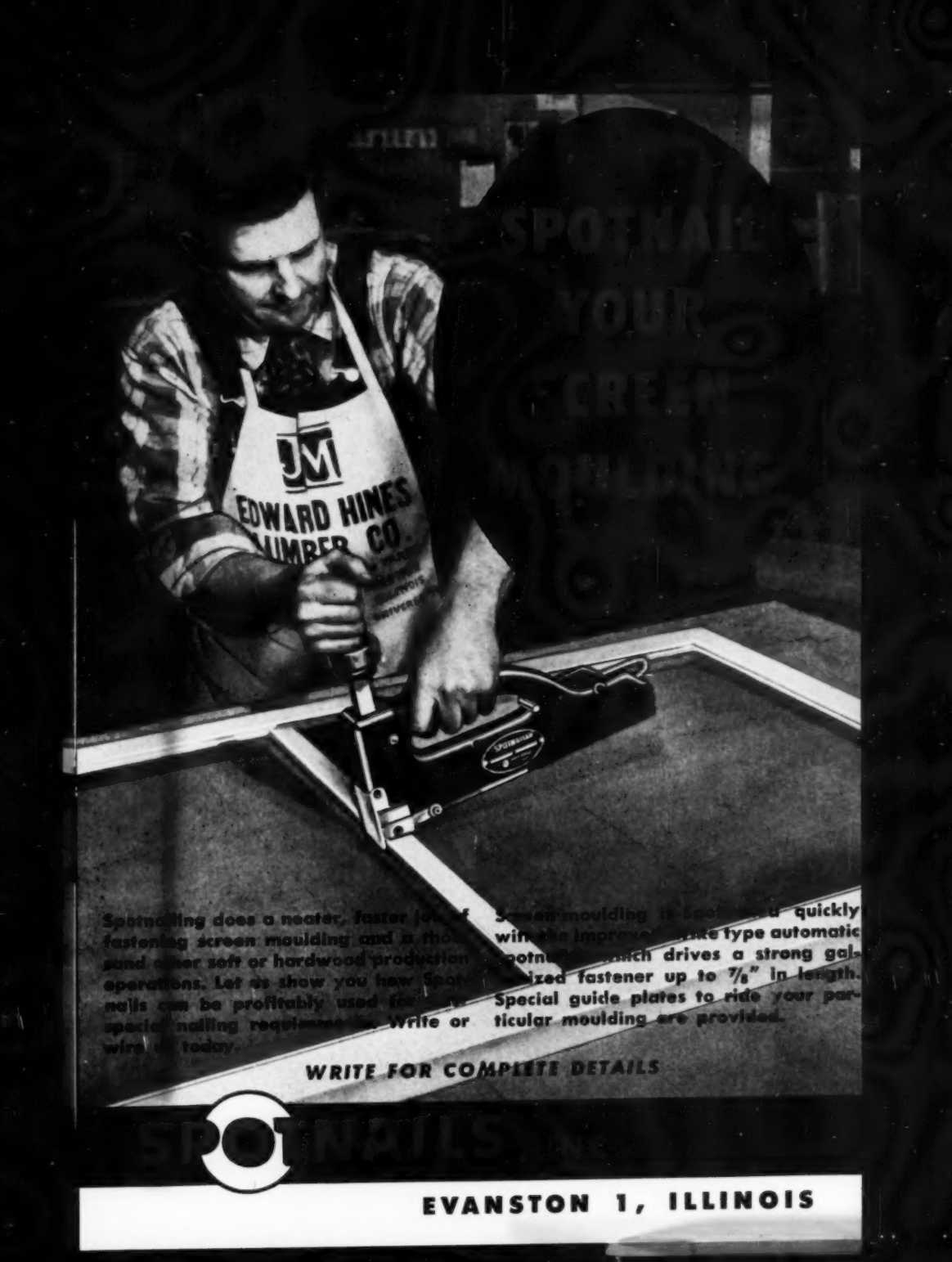

Spotnailing does a neater, faster job of fastening screen moulding and a thousand other soft or hardwood production operations. Let us show you how Spotnails can be profitably used for your special nailing requirements. Write or wire us today.

Screen moulding is fastened quickly with the improved Spotnailer type automatic Spotnailer which drives a strong galvanized fastener up to 7/8" in length. Special guide plates to ride your particular moulding are provided.

WRITE FOR COMPLETE DETAILS

SPOTNAILS, INC.

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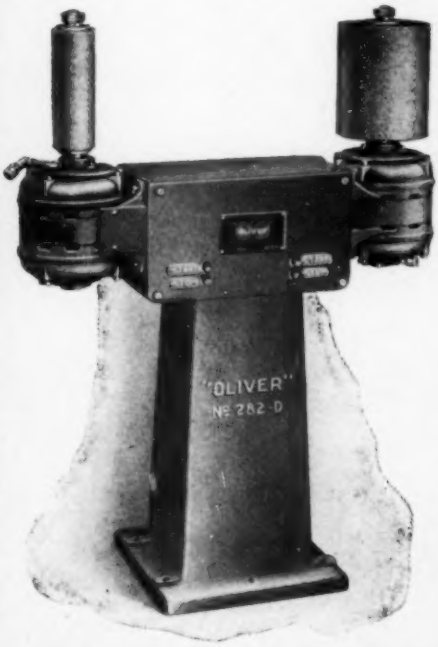
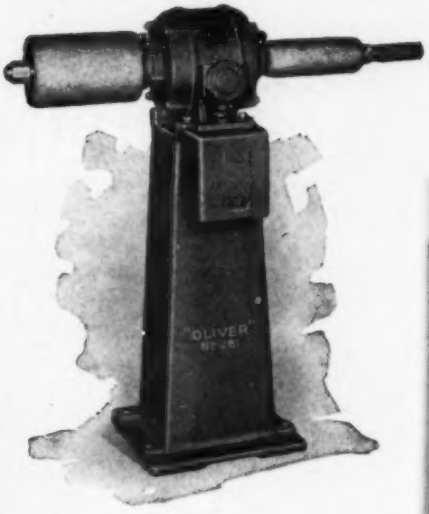
save valuable time sanding curved and odd shaped pieces

"Oliver" No. 281-D

DOUBLE END DRUM SANDER

This Sander is unmatched for sanding parts of chairs, tables, etc. where the grain runs lengthwise. When slightly inflated the soft drum conforms to any convex curve; when fully inflated the barrel-shaped cushion is adapted to sanding concave curves. Carries pneumatic drums 9" long, 2" to 12" diameter. A sanding cob 6" long, 1" diameter can be attached to end of spindle. Write for Bulletin 281-D.





"Oliver" No. 282-D

VERTICAL DRUM SANDER

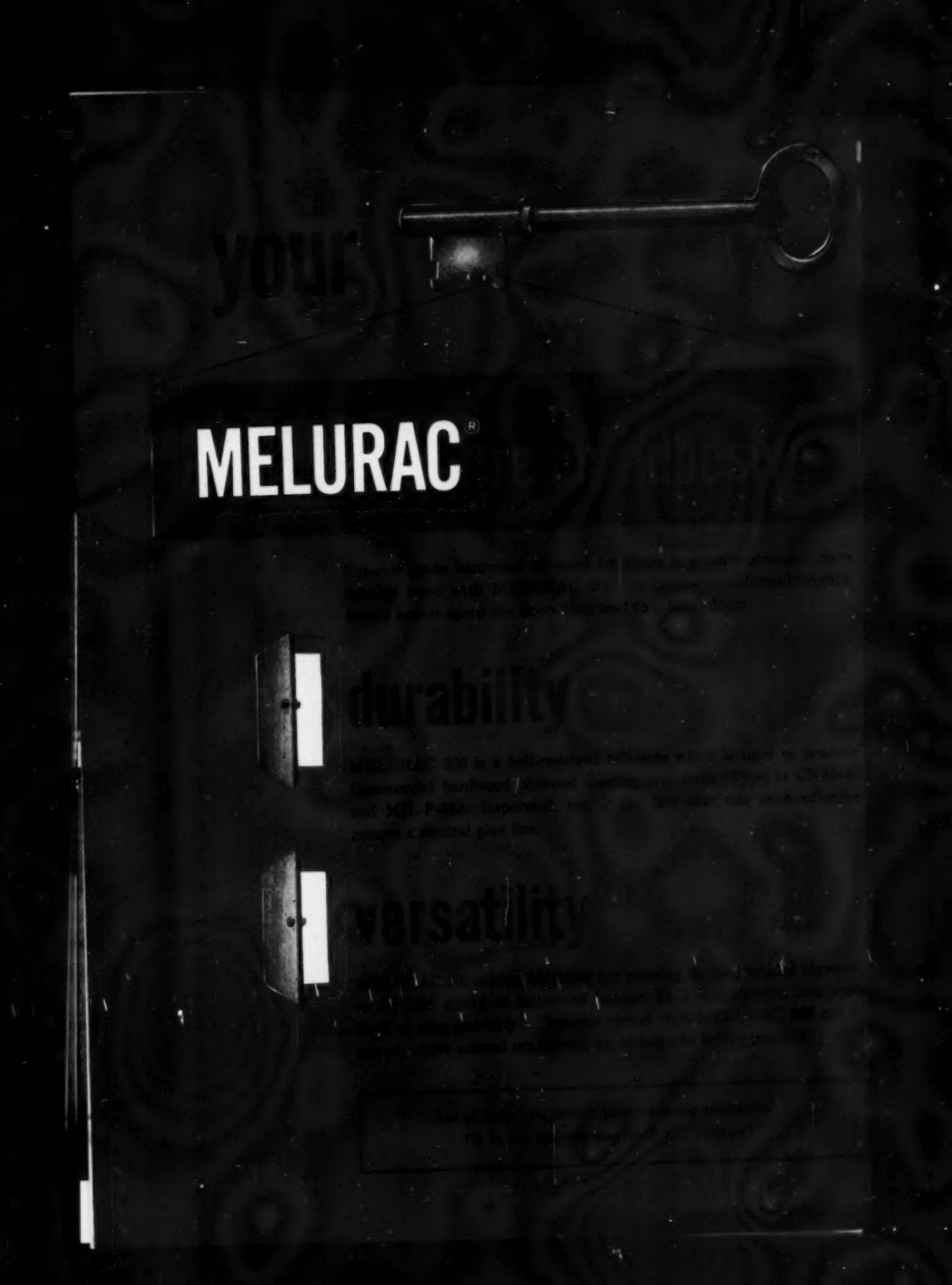
Ideal for sanding stock where the grain runs lengthwise the curve. The large and small drums sand all curves. A slightly inflated drum is used for convex curves; a fully inflated drum for concave curves. Diameter of drums ranges from 2" to 10". Write for Bulletin 282-D.

For a paying solution of your sanding problems, place them before our engineers. Besides these Drum Sanders, the "Oliver" line also includes various Belt and Disk Sanders.

OLIVER MACHINERY COMPANY

Established 1890

GRAND RAPIDS 2, MICHIGAN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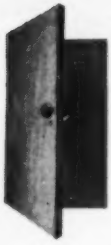

faster cure time

A brand new catalyst, Hardener N-325, has been developed to cut glue-line cure time of MELURAC 300 by 30%. (Approximating cure rate of hot press Urea resin adhesives.)

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$395. F.O.B. FACTORY

TABLE $195.00 EXTRA

WRITE FOR FREE FOLDER

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BEACH

MANUFACTURING CO. • MONTROSE, PA.

Wood Working Digest

JUNE, 1951 — OUR FIFTY-THIRD YEAR

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Air-Powered

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Expect your No. 453 Sash and Door Clamp to do more work, require less skilled operators, because better engineering has built into it exclusive Center-line Pressure—power is exerted directly on the work in a straight line. Frequent changes from size to size and from sash to door are no problem at all.

The Handy No. 453 Speed-Tru is proven. The men who own them and those who run them are enthusiastic about this revolutionary machine and the way it out-performs. Write at once for full specifications.

HANDY Manufacturing Company

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Convenient handling characteristics, time-tested performance, and a choice of catalysts for all bonding needs make UFORMITE 435 your best buy in resin adhesives. Write today for full information.

Free Engineering Service. Request booklet giving suggestions for bulk storage installations—or ask our Engineering Department to help you with your specific storage problem. There's no obligation.

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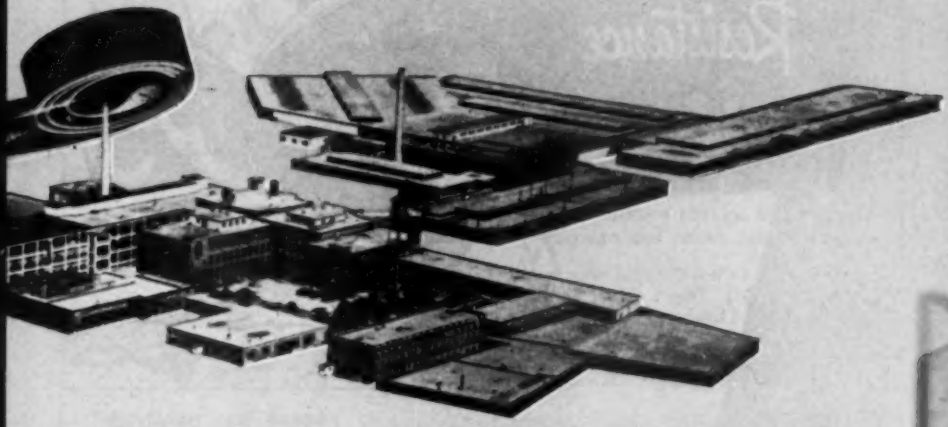
Your Source of 30,000

BEHR-MANNING

COATED ABRASIVES · SHARPENING

NORTON abrasives

COATED ABRASIVE PRODUCTS



BEHR-MANNING PRODUCES EVERYTHING YOU NEED IN COATED ABRASIVES . . .

A statement like that takes in a lot of territory. . . . But we can go even farther and say that BEHR-MANNING produces abrasive products that you *may not now know that you need*, but which if used in your production processes may well bring you important additional profits. For within the 30,000 abrasive products mentioned above, some are very new and their possibilities not yet generally realized.

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TO MAKE SURE that your sanding and finishing methods are *right* for your needs, utilize the BEHR-MANNING Methods Room located nearest you. Take advantage of the abrasive engineering experience available there, without obligation. Try out the latest abrasive methods on your own work.

Full details on this free service, and location of Methods Room nearest you, are covered in the book, "Proving Ground for Production." Write for your copy today. Address Dept. WD-6.

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FOR BONDS OF

Greater Moisture Resistance

AND 2 OTHER IMPORTANT EXTRAS-

Free to you

A COMPREHENSIVE TECHNICAL SERVICE

Files of the Plaskon Technical Service are full of case histories proving how helpful this service can be in connection with development of glue-line problems—and helping you to solve problems wherever they exist. Plaskon experts are used to working—in shirt-sleeves—with room at elbow. And where the situation demands, they can call on the facilities of the various Plaskon Technical Service laboratories for aid on gluing problems.

USE PLASKON *Triple-Action* HARDENERS WITH PLASKON LIQUID RESIN GLUES!

The wide range of hardeners available with Plaskon *Liquid* Resin Glues gives you the opportunity to alter your formula to suit varying conditions without inconvenience at any time. And Plaskon Hardeners are real TRIPLE-ACTION Hardeners—scientifically blended to give you *more moisture-resistant bonds*, stronger bonds and lower glue-line costs.

Rigid production and laboratory control in the processing of Plaskon *Liquid* Glues assures uniformity through every shipment you receive. You always get *all* of the bonding strength you pay for!

It will pay you to have all of the facts on Plaskon Liquid Glues, now available in low- and high-solids types for hot and cold pressing. Write today!

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Also Producers of Molding Compounds and Coating Resi

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Triple-Action HARDENERS HAVE HELPED MAKE PLASKON THE OUTSTANDING VALUE IN POWDERED GLUES, TOO!

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PLASKON.

RESINS

GREEN LUMBER MEANS TROUBLE FOR YOU, TOO!

• G-R-E-E-N L-U-M-B-E-R spells PROFIT LOSSES, especially these days with high operating costs and skyhigh taxes! You *must* find ways to increase production and eliminate waste and rejects.

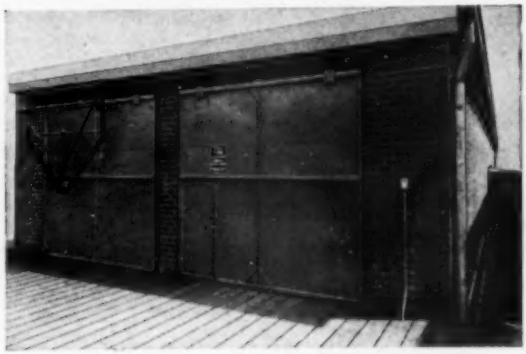
The *surest* way to keep *your* profit level high is to depend on Standard Dry Kilns for exact conditions, uniformly delivered throughout every load—giving fast, uniform drying without checks, honeycomb, undue warpage and other defects.

Need a new kiln? Need to remodel an old natural draft type? Don't gamble! You can rely on Standard's internal fan, automatic reversible cross-recirculation—the *re-order* choice of leading woodworking operators throughout the country!

"Anything can happen when you have to use lumber THIS Green!"

•

C. F. Work & Sons, Inc., of Memphis, relies on the uniform distribution of heat, humidity and ventilation provided by world-famous Standard dry kilns to turn out the quality-dried lumber that has helped build their reputation for highest quality hardwood specialties.



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WESTINGHOUSE RF Equipment Produces flatter panels

...saves money on finishing

Pick any point on your production line and we'll show you how Westinghouse RF Generators can save you time . . . money . . . and help produce a better product. The plywood plant of the Caswell-Runyan Division of Newport Steel Corporation at Goshen, Indiana, for instance, replaced their old glue wheel operation with Westinghouse RF Heating Equipment. What happened? Cores are now produced at *double* the rate of the old process. Joints, by all standards, are 100% satisfactory.

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Call your Westinghouse representative today to learn how RF heating can help *you*. Or write to Westinghouse Electric Corp., 2519 Wilkens Ave., Baltimore 3, Md., for free booklet, B-3946-B, "Radio Frequency Heating for the Woodworking Industry."

J-02192-A

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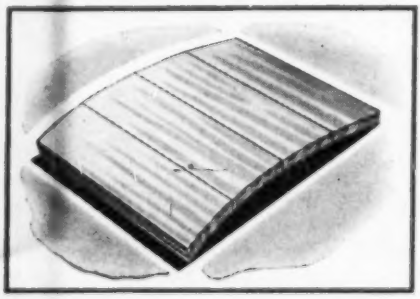
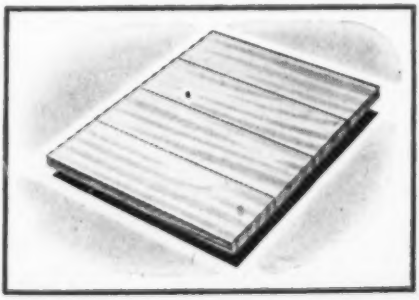


Get This



YOU CAN BE **SURE**.. IF IT'S

Westinghouse

A Westinghouse 10-kw, 5-mc RF Generator is installed with a Hart-Union Electro Gluer at Caswell-Runyan. Entire installation is certified to meet FCC regulations.

Westinghouse

RF HEATING

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Is this clue to quality on your product?

BY USING PHILLIPS SCREWS on your product, you prove *on sight* that you use extra care in manufacture. The public knows that X marks the spot — the identifying X formed by the cross-recess on the head of every Phillips Screw. It is the mark of extra quality.

These screws — wood, machine or tapping — add structural strength, set up tighter, resist the loosening effect of vibration. They are speedier — and cost saving because they save time, work, money. They start faster, eliminate driver skids, damaged parts, split screw heads. They make good workers out of green help — fast!

Be sure to include Phillips Cross-Recessed-Head Screws in your specifications.

PHILLIPS *Cross-Recessed-Head* SCREWS

X marks the spot . . . the mark of extra quality

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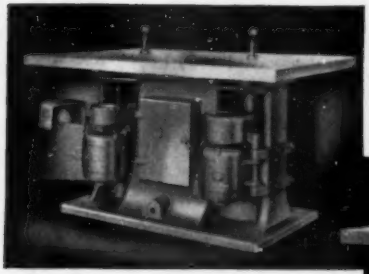
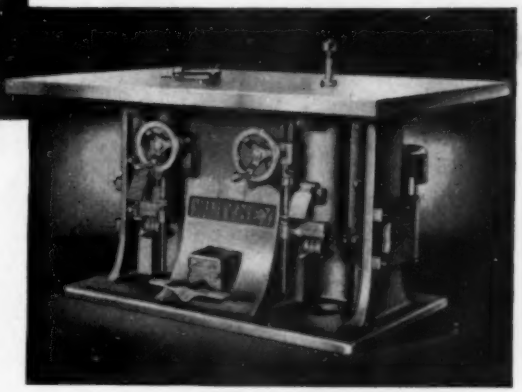
THE FASTENERS OF TODAY . . . AND OF THE FUTURE

Check rising production costs *with* WHITNEY *Production* SHAPERS



REAR VIEW — Showing high speed spindles driven from motors mounted on shaper base.



WHITNEY No. 91
Double Spindle Shaper
Requires No Frequency Changer

Features of
WHITNEY PRODUCTION SHAPERS

- Spindle Speeds up to 9000 R.P.M. for Heavy Duty Series
- Up to 15000 R.P.M. for Light Series
- Built-in Spindle Locks
- Spindle Brakes on H.D. Series
- Heavy Duty Ball Bearing Spindles
- Detachable Spindle Tops
- Convenient Controls

Materials and labor costs are still on the rise. There's no better time than NOW to check these rising costs. Examine your present equipment with a critical eye.

Whitney High Speed Production Shapers can lower your shaping costs thru increased production, more output per operator, better, smoother work requiring a minimum of sanding, less handling and less waste. They are economical to operate and give dependable service thru the years — require no frequency changer. There is a size and model for every shaping need. Investigate today! Write for bulletin D6.

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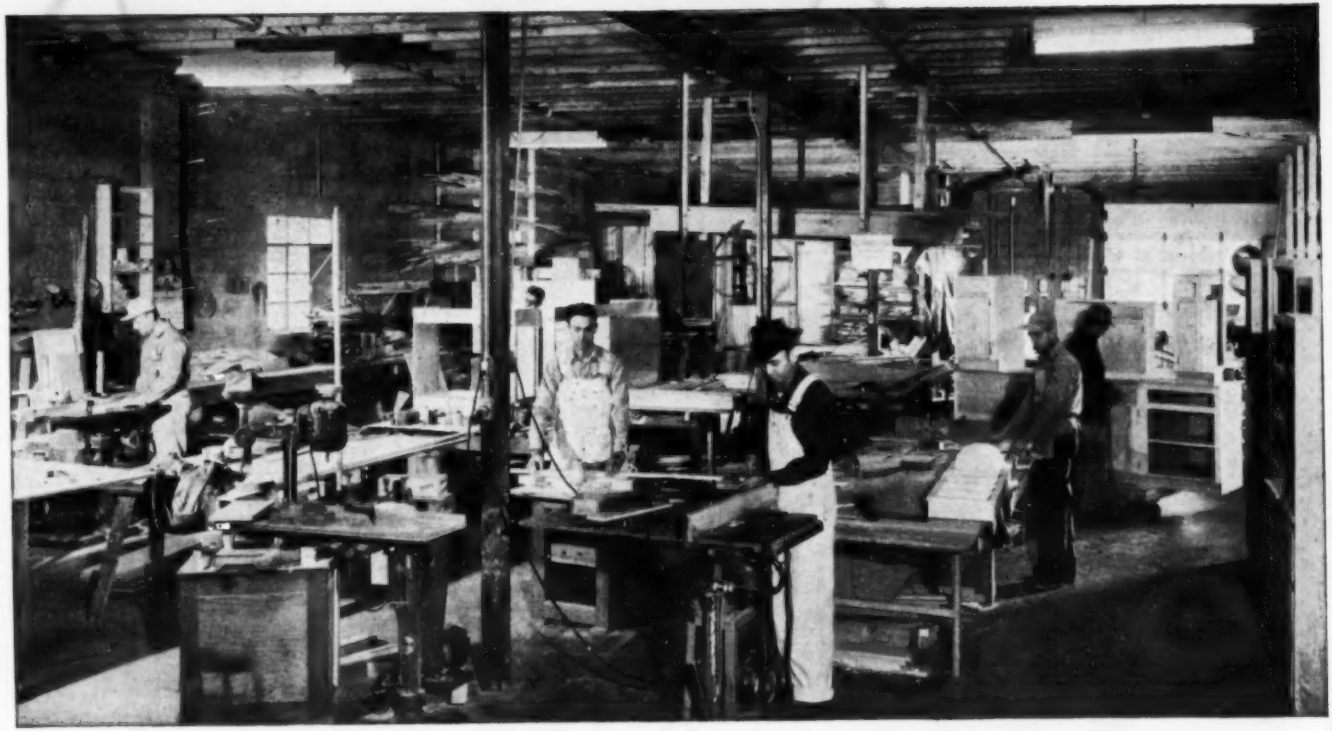
PLANERS • SHAPERS • VARIETY SAWS • MORTISERS • BACK KNIFE LATHES

WINCHENDON, MASSACHUSETTS, U. S. A.



Output goes up as costs stay down

for this Delta tooled Cabinet Shop

Only $3.64 per day to operate six machines

	Hours	Cost per Hour	Cost per day 250 days
2 Delta Tilting-Arbor unisaws —4 hours each	8	$0.16	$1.28
Delta Multiplex 30-A Radial Arm Saw	1	.41	.41
Delta 12" Jointer	2	.33	.66
Delta S-2 Shaper	3	.32	.96
Delta Tilting-Table Saw	1	.33	.33
30% of Total Shop Man-Hours	15		$3.64

These cost figures make due allowances for maintenance and conservative depreciation and other costs.

With no means for measuring the time saved by these Rockwell tools, it is agreed that the annual saving is a tremendous number of hours.

"It takes careful work and good machinery to turn out quality cabinet work that 'sells itself'—and Delta Tools are the backbone of our equipment," says Forest F. Wallis, proprietor of Wallis Cabinet Shop, North Kansas City, Missouri.

Wallis' five workers swear by their Delta helpers—find them ideal for high-speed accuracy, dependability and safety. Operating costs are remarkably low, maintenance costs have been negligible, and there has been no time off because of power tool accidents.

Do you dream of owning a shop of your own? Now's a good time to get established, by making some of the countless hard-to-get items. Delta can be of tremendous help to you—as to the tools you need, how to lay out your shop, some vital "DO'S" and "DON'T'S." Talk to the Delta Dealer, an important man to know.

There's a Delta Power Tool for Your Job- WOOD OR METAL WORKING

53 MACHINES — 276 VARIETIES — MORE THAN 1300 ACCESSORIES

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DELTA POWER TOOL DIVISION

Rockwell MANUFACTURING COMPANY

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An "Eager Beaver"

- WITH FEWER TEETH
- QUIET IN OPERATION
- LESS POWER REQUIRED
- MINIMIZED KICK-BACK

That's...

SIMONDS

NEW DESIGN

EASY-CUT SAW

Solid-Tooth or Carbide-Tipped
8 or 12 Teeth to the Saw
6" to 16" in Diameter

This new saw design has only 8 or 12 teeth instead of the usual 36 to 100. And it has something else, too . . . a plate of Simonds Steel finished to a super-smooth surface that banishes friction and reduces pickup of pitch and gum. What's more, each saw is accurately toothed, carefully sharpened and expertly fitted to give you top cutting efficiency. So get Simonds "Easy-Cut" Saws for ripping, cut-off or combination work on table or radial-arm machines. See your Simonds dealer *today*.

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FITCHBURG, MASS.

Branch Offices in Boston, Chicago, San Francisco and Portland, Ore. Canadian Factory in Montreal, Que.

"FINISHING COSTS have been cut... QUALITY improved"

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DULAC CLEAR HOT APPLICATION LACQUERS

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*Name on request

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BAR TOPS...

GUN STOCKS...

BROOM HANDLES...

...OR GOLF CLUBS

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Consult our engineering department for suggestions as to whether and how our hot spray lacquers may be adapted to your finishing problems.

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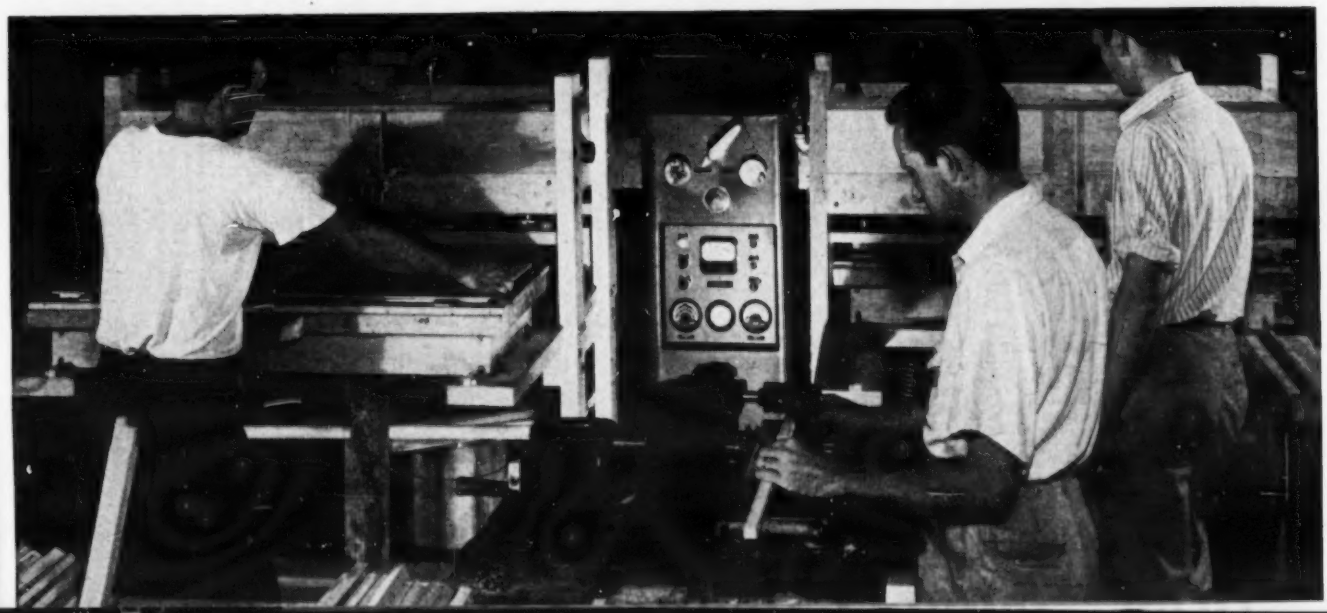
MANUFACTURERS OF INDUSTRIAL FINISHES

The Globe-Wernicke Co.

doubles panel output per man



with Thermex Electronic Bonding Equipment

NOT LONG AGO The Globe-Wernicke Co., of Cincinnati, was securing cleats on the side panels of TV sets by conventional nailing and gluing. Panel output was 125 per man per shift.

Output per man-hour more than doubled with the installation of THERMEX Electronic Bonding Equipment. Nailing is dispensed with. Cleats and panels are placed in special fixtures and the THERMEX equipment turned on. Electronic currents do the rest—curing in a matter of seconds.

Increased output isn't the whole story. Rejects, formerly at a high level, are now negligible. Quality of the panels has been improved. And floor area needed for the operation has been reduced.

Users like Globe-Wernicke find that savings soon pay off the entire investment in THERMEX equipment, and then go on giving a substantial return year after year. Why not investigate for yourself?

A THERMEX engineer will be glad to study your operations and make recommendations—at no obligation. Write The Girdler Corporation, Thermex Div., Louisville 1, Ky.

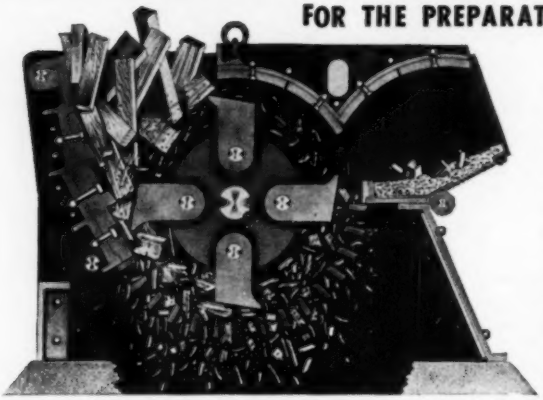
THERMEX—T. M. Reg. U. S. Pat. Off.

Thermex
ELECTRONIC BONDING EQUIPMENT

EDGE-BONDING OF LUMBER • MOLDING OF LAMINATED PARTS • BONDING PANELS-TO-FRAMES • FABRICATION OF ASSEMBLIES • BONDING OF PLYWOOD

WILLIAMS "NO-NIFE" HOGS

FOR THE PREPARATION OF WOOD REFUSE FOR BOILER FUEL



Sectional drawing of Williams "No-Nife" Hog showing how the fast revolving hammers cut the wood refuse by impact.

Williams new and improved "No-Nife" Hogs are now offered for use in all wood working plants. Experience has proven, that when properly handled, wood refuse is the cheapest fuel for all wood working plants. Therefore, the wood refuse utilized in this manner not only insures a proper fuel supply, but also provides a convenient and economical method of cleaning the refuse from the mill and disposing of it without additional expense.

Hog fuel as made with the improved "No-Nife" Hog.

ALSO USED FOR REDUCING WET OR DRY VENEER AND PLYWOOD SCRAP

The Williams "No-Nife" Hog will reduce wet or dry Veneer and Plywood Scrap to a uniform size wth no long slivers or big pieces—thus the finished product can easily be handled in pneumatic air lines. No need to worry about elbows of your system becoming clogged. Hundreds of satisfied users attest to their dependability.

WC81-2

CHECK ✓ THESE FEATURES

- Many sizes of "No-Nife" Hogs to choose from.
- Adjustments to overcome wear.
- Larger feed opening.
- Hinged cover—instant accessibility.
- Easy to work on.

WILLIAMS ALSO MAKES...

Hogs and Shredders for making wood flour and sawdust. Vibrating Screens and Air Separators to work in closed circuit with our Shredders for absolute control of product size.

Williams Patent Crusher & Pulverizer Co.

808 St. Louis Ave. • St. Louis 6, Mo.

WILLIAMS

CRUSHERS GRINDERS SHREDDERS

"This SKIL Drill is a Work Horse"

says HERMAN TANAW, builder of custom made boats at Stellermarine Research Corporation, Miami, Florida

SKIL Drills work 8 hours a day for 3 weeks on every custom made boat this company builds

Herman Tanaw uses SKIL Drill Model 47 to attach a gusset to this boat frame.

"Our SKIL Drill is the most used tool in our shop but it never gives us any trouble," says Tanaw. SKIL Drills meet every requirement of accuracy, speed, compactness and continuous dependability. 25 models, all packed with power, perfectly balanced. Call your SKIL Distributor. He will be glad to give you a demonstration and make recommendations.

SKIL Drill—Model 47—¼" compact, heavy duty drill. Capacity in hardwood: 0" to ½"; in steel: 0" to ¼". Standard speed: 1800 r.p.m. Faster and slower speeds available. Overall length: 7¼". Weight: 3½ lbs.

SKIL PORTABLE TOOLS

SKIL Products are made only by Skilsaw, Inc.
5033 Elston Avenue, Chicago 30, Ill.

Skilsaw Factory Branches in principal cities
In Canada:
Skiltools, Ltd., 66 Portland Street, Toronto, Ont.

Higgins, Inc. uses waterproof Lauxite MF-300 for their bonded mahogany cruisers and hardwood floors.

waterproof bond : colorless glue line

When you're looking for waterproof performance from your adhesives—as Higgins does for their cabin cruisers and hardwood floors—we suggest you investigate Monsanto's melamine-formaldehyde resin, Lauxite MF-300.

Used alone or to fortify Monsanto's urea adhesive resins, Lauxite MF-300 produces a weatherproof-waterproof bond... PLUS a bond of superior strength and durability; and a colorless glue line.

Lauxite MF-300 cures rapidly at intermediate and hot press temperatures. Veneer moisture content is not critical; pressing cycles are short. And – there's no need to wash glue room equipment when converting from urea to melamine glues.

For uniformly high quality production *day after day,* use Lauxite MF-300. For information, write: MONSANTO CHEMICAL COMPANY, Plastics Division, Room , Springfield 2, Mass.

Lauxite: Reg. U. S. Pat. Off.

The big MONSANTO family of adhesives

SERVING INDUSTRY... WHICH SERVES MANKIND

"The eye of the master will do more work than both his hands."

—Ben Franklin's Almanac, 1757

Touring thy plant with a critical eye can do more for the health of thy business than a trip to Washington.

—Acme Steel Notebook, 1951

Your management eye needs to be a dozen places at once these days—on supplies, on production, on deliveries and all over your plant to keep efficiency high and morale up.

Your Acme Steel representative is ready to help bring you greater thrift in the use of Acme Steel's flat steel strapping and stitching wire in your packaging, shipping, and materials handling operations. He may be able to suggest more efficient ways to use Acme Steel products and accessories to improve your use of the available supply.

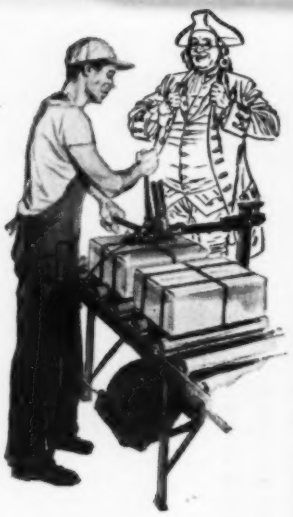
In spite of an increase in productive capacity, U. S. military requirements for some products make it impossible for Acme Steel to meet all the demands of the 50,000 customers, representing nearly every American industry, in these rearming times. But Acme Steel tries to help in every way we can—we always have for more than 70 years.

Information for ready reference on Acme Steel products is available upon request.

ACME STEEL COMPANY

Dept. WD-61, 2838 Archer Avenue, Chicago 8, Illinois

To contact the nearest of our 46 Service Offices in the United States and Canada, check your telephone directory, or write us.



5 things you can do to keep your Acme Steel Strapping Tools on the job:

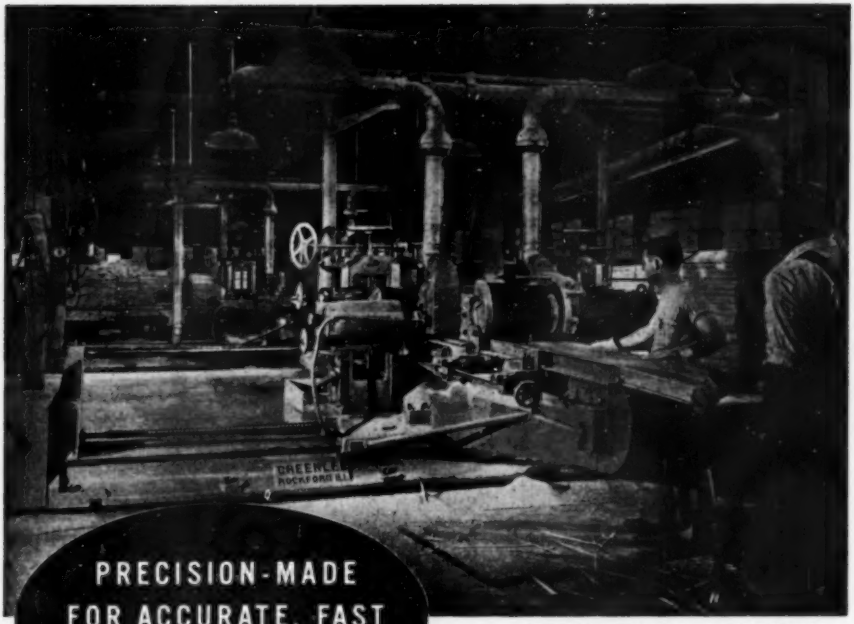
1. Clean and oil every week.
2. Check and clean gripping dogs weekly. Replace when teeth are worn.
3. Detect worn punches and jaws early by checking sealed joints regularly. If in doubt, submit samples, identified by model and serial number, to Customer Service Department, Acme Steel Company.
4. Keep parts list and supply of spare parts handy to make minor repairs. Additional parts lists supplied upon request.
5. Ask us about the Acme Steel "3-WAY SERVICE PLAN" for equipment repairs.

ACME STEEL CO. CHICAGO

ACME STEEL

Acme Steel Company has enjoyed sound, steady growth under the American business system of open competition. Since 1901 we have made 286 consecutive dividend payments to our stockholders.

ACME STEELSTRAP flat steel strapping and ACME UNIT-LOAD carload bracing BAND, SEALS and TOOLS • ACME SILVERSTITCHERS and ACME SILVERSTITCH WIRE for box stitching • ACME-MORRISON METAL STITCHERS and BOOK STITCHERS • ACME-CHAMPION BAG STITCHERS • ACME HOT AND COLD ROLLED STRIP STEEL • ACME GALVA-BOND steel slat stock for Venetian blinds • ACME STEEL SPECIALTIES, including hoops, corrugated fasteners, nail-on strapping and other container reinforcements • ACME STEEL ACCESSORIES—snips, cutters, punches, tool mounts, reel stands, coil holders, coil trays.



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FOR ACCURATE, FAST
PRODUCTION

GREENLEE DOUBLE CUT-OFF SAW IN OPERATION AT
STATESVILLE PLYWOOD AND VENEER COMPANY

...Greenlee No. 542 Electric Double Cut-Off Saw

"We wish to congratulate you on the fine double-end trim saws recently placed in operation here. They show beautiful workmanship and they really do a fine job."

That's what Mr. Elbert M. Shelton, president of Statesville Plywood and Veneer Company, Statesville, N. C., has to say about their new GREENLEE No. 542 Cut-Off Saws.

Reasons are many why the GREENLEE No. 542 does such smooth, accurate work . . . and at high speed! First is because each one is made so sturdily . . . built to handle the work with ease and stand up under production requirements at high speeds for a long, long time.

Next is its "watchwork like" construction and the precise setting arrangement which permits making adjustments to a fraction of 1/64". Accurately graduated dials show the exact setting of the movable housing, and the machine cuts exactly to the size indicated by the dials.

And remember, too, the GREENLEE No. 542 is extremely versatile. In addition to its double cut-off operations, with attachments it will handle your shaping, relishing, tenoning, dadoing or scoring.

Get all the details on this precision machine today. Write Greenlee Bros. & Co., 1866 Twentieth Avenue, Rockford, Illinois.

MACHINERY & TOOLS
GREENLEE

GREENLEE WOODWORKING MACHINERY: MORTISERS • BORERS • SAWS • TENONERS • PLANERS • SHAPERS • MORTISING and BORING TOOLS

Save Up To 80% On Sandcloth Costs

*Patented

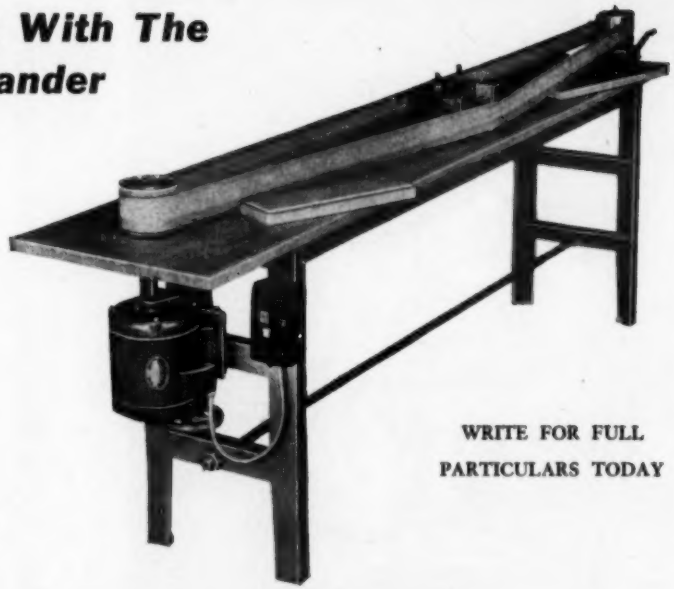
WITH THE PEARSON MODEL A SANDER*

Many plants have reported a saving of 60% to 80% on sandcloth in sanding irregular shapes with the Pearson Model A Sander. Motor shaft tilts from 0 to 90 degrees permitting head to fit beveled moulding angle perfectly. Sands one or more stepdowns at the same time eliminating several costly operations. The sanding of inside radii of circles and very flat tapered moulding is another cost saving feature of the Model A Sander. It is one of the fastest and most efficient sanders for irregular shapes on the market today.

Standard equipment includes 7 metal heads and 14 cushions made of the finest grade rubber. Length of cushions range from ¾ to 4 inches; outside diameters, 3¼ to 7 inches. With the Pearson Belt attachment, the Model A can be converted to an all purpose sander at a small additional cost.

Faster, Smoother Sanding With The Pearson Block and Edge Sander

Sands straight mouldings and round corners in one simple operation. Belt can be removed and by attaching Pearson (Patented) metal heads, this versatile sander can be used as a "straight-up" spool sander. Motor can be raised (or lowered) up to 4 inches. Equipped with 1½ H.P. motor, 4 and 6 inch drive pulleys, belt, and Gregory Butt Block complete with felt cushion shaped to fit any one mould. Length of belt is 19 feet; table 22 inches wide. Overall length is 11 feet.



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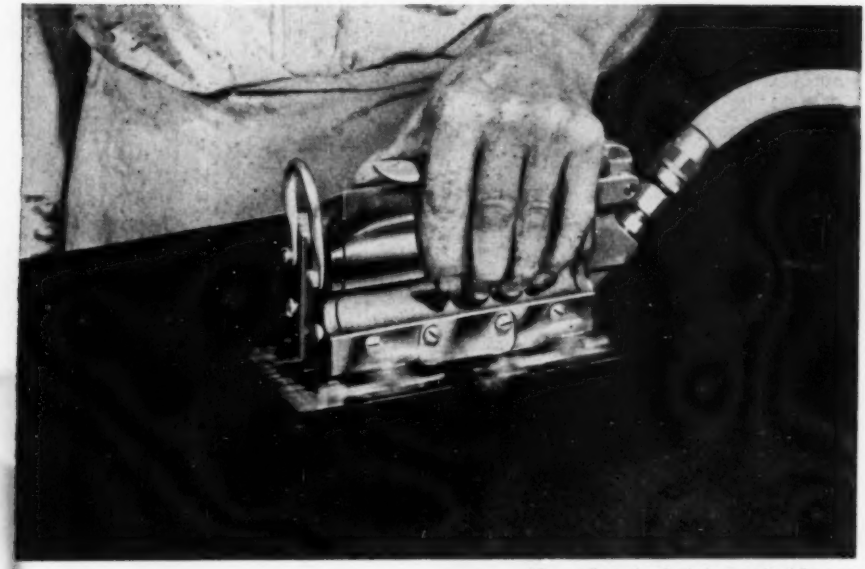
Also manufacturers of Waterfall Belt Sanders and Grill Sanders

PEARSON SANDING MACHINE CO., INC.

HIGH POINT, N. C.



No. 3 of a series depicting method for perfect wood finishing with Sundstrand Sanders

Padding Filler . . . a fast, easy operation with Straight-Line Action Sundstrand Air Sander

On sprayed or brushed-on filler, as well as limed finishes, the Sundstrand Sander performs the padding-in operation perfectly, quickly—replaces the costly and fatiguing hand padding. Sundstrand *Straight-Line Action* reciprocates pads so that filler is forced into open grain. Contact your local supplier or write for useful wood-finishing information—ask for bulletin WW-6.

SUNDSTRAND

SUNDSTRAND AIR SANDERS

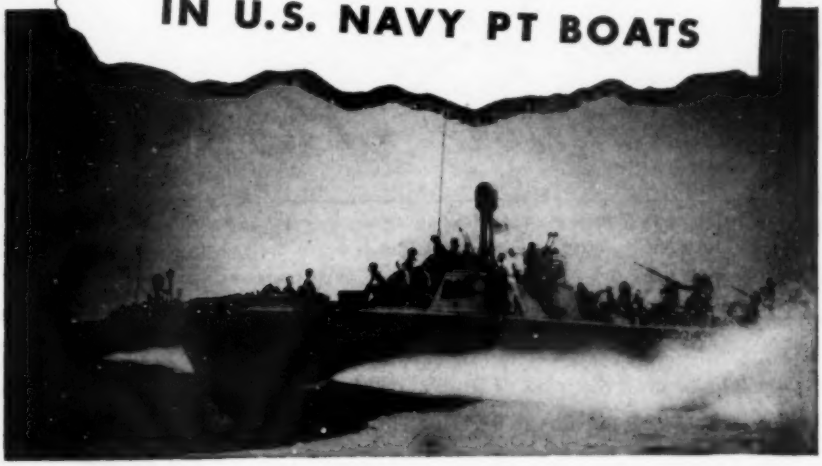
SUNDSTRAND MACHINE TOOL CO.

PNEUMATIC DIVISION, ROCKFORD, ILLINOIS

Penacolite® Resorcinol Adhesives

"Service Proved"

IN U.S. NAVY PT BOATS



Penacolite Resorcinol-Formaldehyde Adhesives, the original durable adhesives for room-temperature bonding, were indispensable to the construction of PT Boats, other naval craft, many aircraft components, gliders, etc., that helped win World War II.

These same Penacolite Adhesives—manufactured under closest control, and proved in service—are the most dependable bonding agents for your present defense work.

Call your nearest Koppers Chemical Division office and arrange for your supply of the proper Penacolite Adhesive for the defense job you are considering. Our technical service is always at your call.

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KOPPERS COMPANY, INC.

Chemical Division, Dept. WWD-6, Koppers Bldg., Pittsburgh 19, Pa.

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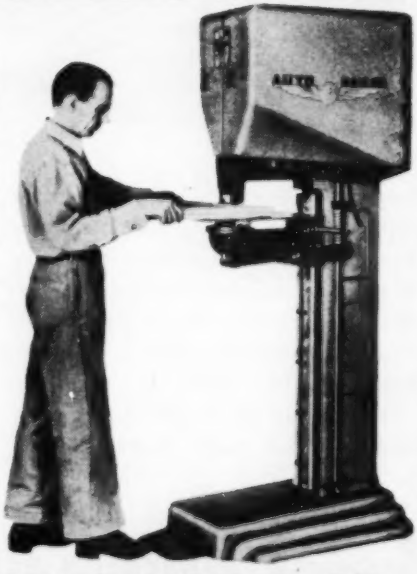
Auto-Nailer does the work of from 3 to 5 men hand nailing. It puts out more work . . . faster . . . better. Auto-Nailer makes, drives and sets 3 nails a second—in all materials. No nails bent, dropped—no work split—every nail becomes a part of the product. Has quick, accurate settings for nail length and countersink.



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The Philadelphia *Story*

For those of you who were unable to attend the Annual Meeting and Industry Show held by the Forest Products Research Society in Philadelphia last month, we report some of our observations. The technical meetings were up to the high standards previously established by the Society and what the show lacked in number of exhibits, it made up in quality of these displays.

The comparatively light attendance worked out well in view of the limited number of exhibitors as it gave all concerned a good opportunity to discuss their products and problems.

We are certain that the Society has learned much about the production of a large scale show and I hope they will not attempt another one too soon. It would seem that one every two, or even three years, might be often enough. Appreciation is due the members who worked on various committees to make both the technical sessions and Industry Show a success. However, the thought occurs that it might be well to engage a concern that makes show and convention production its business to handle the affair, relieving our membership of some of this responsibility.

Some of the exhibits must have cost the manufacturers a great deal of money. These displays were complete to the last detail. All of the exhibits had real value for anyone seeking information about new equipment and materials and the exhibitors should be complimented for the fine work they did. May we add a note of pride? Practically all of them advertise in WOOD WORKING DIGEST!

Ned Bailey
Editor-in-Chief

Still going strong after 28 years . . . General Manager Charles M. Brink and Moulding Department Foreman Henry Madsden of Pacific Manufacturing Company watch the operator feed a Vonnegut Moulder originally shipped in 1922.

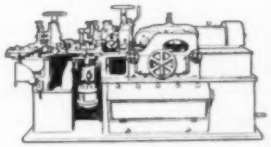
28 Years... Still Going Strong

Moulders, Glue Jointers and Tapeless Splicers . . . these are the Diehl Wood Working Machines you find at Pacific Manufacturing Company, Santa Clara, California—one of the largest detail mills west of the Mississippi.

Behind one of the five six-inch moulders at Pacific Manufacturing is a story. For this machine, bearing Serial No. 85 was shipped to the West Coast in August, 1922—is 28 years old, and still going strong.

You'll find this same kind of long wear-life in the *newest* models of Diehl — Vonnegut Moulders, *plus* refinements which simplify set-up time, make the work go faster. And you'll find long wear-life in other Diehl Wood Working Machines — machines which, like Pacific Manufacturing's Diehl Tapeless Splicers, are still giving trouble-free performance after a decade of service. Complete information about Diehl Machines is yours for the asking.

Write for bulletins today.



Today's Diehl-Vonnegut Six-inch Moulder incorporates the famous vibration-free spindle which helps to assure smooth and true cuts at any speed.

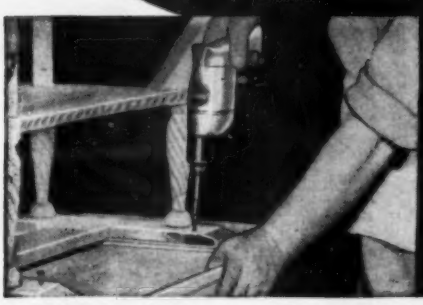
On the Banks of the Wabash

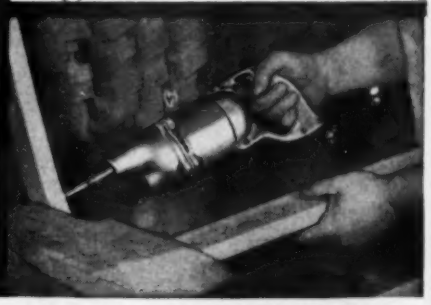
THE G. M. **Diehl** MACHINE WORKS, INC.

WABASH, INDIANA • U. S. A.

LOOK At Their Record ...and You'll ORDER Black & Decker TOOLS!

"SPEEDED UP OUR PRODUCTION 400%", says the ***Pilgrim Upholstering Co.,*** *of their B & D Tools, used by this firm for the past 10 years. The compact B&D HOLGUN* shown here is ideal for drilling pilot holes.*





"MAKE TIGHT JOINTS, 3-5 TIMES FASTER", reports the ***Majestic Wood Carving Co.,*** *of their B&D SCRUGUNS*, used by this company for over 15 years. Easy to handle, these Tools speed up production assembly work, reduce rejects to a minimum.*

"FASTER WORK, LOWER COST, LESS WORKER FATIGUE" are the triple advantages cited by ***Isaac C. Decker, Inc.,*** *for their B&D assembly tools, used for more than 10 years. The Black & Decker Screw Driver shown here is one of 25 versatile models.* *Trade Mark Reg. U. S. Pat. Off.

ASK YOUR NEARBY BLACK & DECKER DISTRIBUTOR for full details on these time-saving, cost-cutting woodworking assembly tools and the many other Portable Electric Tools in the world's most complete line. Write today for your free copy of our catalog with information on over 100 Tools to: THE BLACK & DECKER MFG. CO., 667 Pennsylvania Ave., Towson 4, Md.

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RUSH.....

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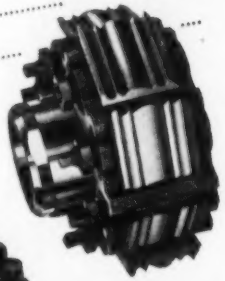
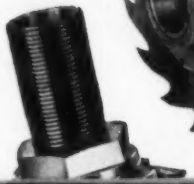
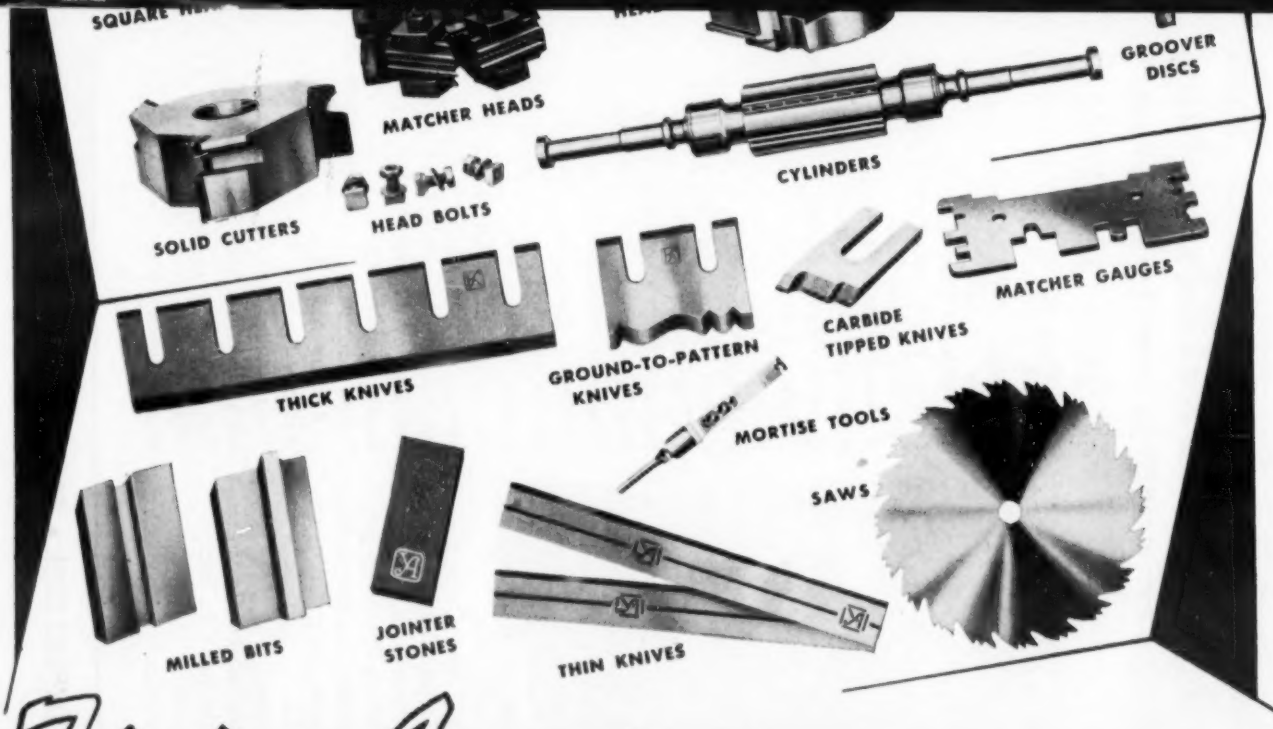




SAW



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Clover Leaf Paint & Varnish Corp.
Essex Chemical Co.
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The Glidden Company
Gloss-Flo Corporation
Grand Rapids Varnish Corp.
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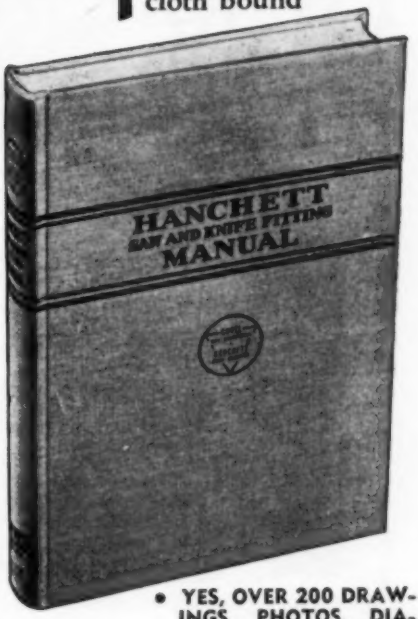

Here—for beginners and experts alike—is an up-to-date book that can pay for itself over and over again! Describes **clearly** and in detail the latest and best methods for securing maximum results in Band and Circular Saw sharpening — tensioning — brazing — welding — swaging — shaping — filing — setting — also knife and shear blade grinding. It's practical — it's authoritative — it's a "must book" for men who maintain — or own this type of production machinery. Order your copy now!

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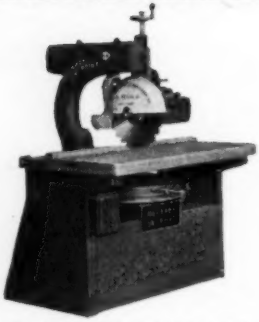

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Pointed Paragraphs

The gradual tightening of controls on metals is giving the woodworking industry a boost in business, particularly where wood wastes are concerned. Compressed sawdust and shavings are being made into many products previously made of metal. Toys, sporting goods, handles for tools and cutlery, boxes for precision instruments and tools are just a few items forced to substitute other materials for metal.

Had a visitor at our booth at the F.P.R.S. show last month who brought home the value of being observant. This Philadelphia gentleman was specializing in the sale of plywoods in small quantities. He found a demand for refinishing furniture and panelled walls in rooms where new TV sets were installed. The plywood used matched the TV set as far as possible. Sounds like the lad who said, "Ma, here's a button. Sew a coat on it, please."

As we see it, we are in for a couple of years of war production prosperity. There is more sense to the business boom now developing than there was in the one that accompanied the last war. Domestic needs are being given serious consideration and their production kept up to as high a level as possible. Arms spending is not fully underway. When it is, domestic production will follow a parallel increase where suitable substitutes for war needed materials can be found

Very often as we fall into the role of a prophet and attempt to make some forecasts about business trends, we recall Walter Lippmann's statement: "How much safer it is to prophesy disaster than to venture a hope! If one prophesies disaster and it comes, one has been a true prophet. If it does not happen, one is readily forgiven and may even suggest that but for the warning the disaster would have happened."

Plywood manufacturers have not as yet felt much increased business through government war requirements. However, by the

(Continued on page 46)

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The redesigned cutter head makes fullest use of the speed and power input under which it now operates. And like all Hawker machines the Model 1951-B is completely Timken bearing equipped; is built to standards of precision, efficiency, and strength common to premium quality metalworking machine tools. See it in operation — Booth No. 778 — Forest Products Industry Show.

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1425 KEOWEE STREET, DAYTON 4, OHIO

MACHINE TOOLS FOR THE WOODWORKING INDUSTRY

(Continued from page 43)

end of June the demand should start, then watch out. The government defense order requiring manufacturers of softwood plywood to reserve 20% of each month's production for growing military needs was announced sometime ago. It is estimated that this will mean 27% of the exterior and 17% of the interior plywood will be put aside for the military. Should defense orders not require the full 20% put aside for any given month, manufacturers are permitted to sell the balance to their regular trade.

As we approach the summer furniture markets, there is a temptation to make a few predictions or at least call a few facts to mind. A recent nation-wide check shows that the retail home furnishing business has stayed near the year ago level. The 1950 figures in this field set a new high. Material shortages have forced TV output to 50% below the 1950 peak. Conversation at the F.P.R.S. meeting showed that some manufacturers anticipated further cutbacks in this field. Many experts feel that regardless of the slower pace in the furniture field, the conditions are basically sound and that lower production rates will continue only until inventories are adjusted.

There is some concern by individuals and organizations over the home building situation. Credit controls have limited the public's "buy-a-bility." However, authorities tell us that the decline in residential construction may not be nearly so great as anticipated. Activities to date compare very favorably with figures from last year.

The Census Bureau's '51 annual lumber survey will be conducted on a quarterly basis in order to provide NPA and industry with as current a set of figures as possible.

With the tight labor situation in many localities and some of our readers experiencing hardship in training new workers, we thought you might appreciate this story. Bill: "You're 15 minutes late again. Don't you know what time we start work?" Dave: "No, sir, they're always at it when I get here."

When interpreting trends or prophesying what may happen there is real danger that many people will not thoroughly analyze the issues. A temporary halt or leveling off—as in the furniture business—may be a good thing. The underlying strong demand for civilian goods plus the steadily growing government requirements for war and defense add up to an unprecedented demand for lumber. Let us not get excited with every change or forecast and we'll find that 1951 will prove to be a good year for our business.

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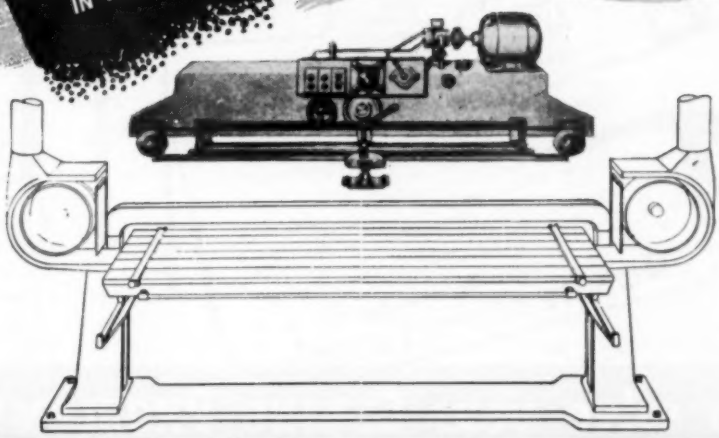

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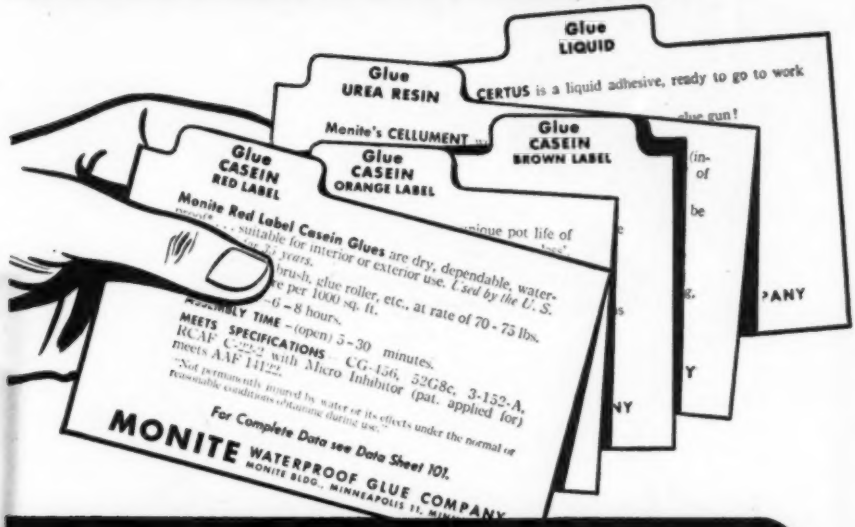

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GLUING
Technique for wood

5. LAMINATED TIMBERS

BY THOMAS D. PERRY

THE BACKGROUND of any picture is important, and similarly the history of any development may show the contrast between the old and new way of solving industrial problems. The development of laminated timbers against the background of solid timbers is a case in question. Available supplies and economic considerations are involved, as well as publicity and promotion. But eventually the old way yields to the new way and the world continues to progress. A glimpse at the background will help the reader to better understand the picture in the foreground.

Solid Timbers Have Limitations

One of the age-old problems in logging and sawmill operations has been to find trees big enough, straight enough and clear enough to cut into large timbers of high quality. Such trees are few and far between, and it would be futile to attempt to predict whether ten or one hundred would be discovered monthly, in any logging operation. Coupled with this uncertainty of supply are two other problems of similar complexity. The heart of a log is not objectionable, from a strength standpoint, if it occurs relatively near the center of the timber, where the loading stresses are less than at the outer faces. However, major knots and defects will always reduce the safe loading of such timbers. Hence, the proper sawing of such a log presents a definite problem, and it takes unusual judgement to cut the largest possible timber of the best possible quality. The third problem is how to dry such large timbers quickly and uniformly with a minimum of degrade. The presence of the heart in the timber distinctly encourages large checks, which may seriously impair strength. It is hard enough to evaporate the moisture from the center, through three to six inches of surrounding wood, but in addition, the shrinkage strains will inevitably cause twisting, warping and checking. Air seasoning is about the only satisfactory method, and it is likely to take months, or even years, depending on the vagaries of the weatherman, to reduce the moisture content of such large timbers to a reasonably useful range.

It is no wonder that these major difficulties have largely discouraged the use of timbers larger than about 6" x 12" x 24 feet long. No lumber dealer could attempt to take orders for substantial quantities of such large timbers within a reasonable delivery date; nor could contractors afford to wait months, or even years, for the timbers needed to complete their structures. This was especially true when standard steel beams of equal strength were readily available, or could be rolled to order in a relatively short time against a guaranteed delivery date.

Again it is no wonder that architects, engineers and designers favor the certainty of steel deliveries against the unpredictable uncertainty of obtaining timbers of wood. It is quite evident that the propaganda favoring steel has put the lumbermen at a serious disadvantage. For some reason, possibly the inherent variables in his product, the lumberman has not been able or willing to promote his potential markets either as aggressively or as successfully as has the steel man. Synthetic products, if steel can be so classified, need vigorous promotion and appear to get it. On the other hand, natural products, like lumber and timber, with which mankind has been familiar for hundreds of years, lag far behind in the promotional procession. Just why such conditions continue is puzzling, but it is impossible to deny the evidence.

Laminated Timbers Are Not New

The idea and practice of laminating curved timbers is not new, but the substitution of laminated timbers for solid straight timbers is a relatively recent development and is in its infancy. Curved arches and bow string trusses have been glued up for many years, ever since it was possible to develop curves from laminations but which could not be fabricated from solid timbers. It was also possible to add reinforcing layers at critical areas in laminates to withstand concentrated stresses. Most of these curved laminated timbers were of special design, custom manufactured, and consequently were rather costly. But their use permitted wide spans and they were easier to erect than steel frameworks. Such wood laminates have been extensively used for churches, chapels, gymnasiums, hangars and warehouses, with complete satisfaction and commendable economy.

The idea of straight laminated timbers in stock sizes and grades has had serious consideration during the last decade and has aroused the interest of lumbermen. Research at the Forest Products Laboratory has been extensive and a number of useful bulletins have resulted. There is a distinct challenge in the idea that large timbers can be made from little trees. Conventional 4/4 lumber can be glued edgewise, scarf jointed endwise, and glued together flatwise to make laminated timbers as large as can be handled and transported. This technique overcomes the three limitations of solid timbers of large size, viz.: (1) production is not delayed by searching endlessly for large straight trees; (2) suitable grades for the different layers can be selected to provide the strongest members at points of greatest stress; and (3) the uniform kiln drying of 4/4 lumber is a standard procedure. In other words, timbers can be made of any desired size for design requirements in a reasonable time from available material, and for a predictable delivery date.

The economics of the development are not clear, since laminated timbers for a known delivery date, will cost more than solid timbers accumulated against an unpredictable delivery date. Whether the cost of solid timbers is now soundly predicated, considering their scarcity, has not been proven. Whether the obtainability of laminated timbers will justify their higher cost can only be determined by experience. Another problem is the degree to which lumbermen are willing to go in aggressively promoting this new venture.

Making Laminated Timbers

The fundamentals of making laminated timbers have been well developed by laminators who have enjoyed some years of experience in the custom making of special designs. While this may not be the last word, since substantial

Table 1. CLAMP PRESSURE REQUIRED PER SCREW

For specific pressures of 100 pounds per square inch

Screw Diameter Required (Inches)	Effective Width for Each Screw (Inches)	Clamp Spacing—Center to Center								
		4"	5"	6"	7"	8"	9"	10"	11"	12"
5/8	2	800	1,000	1,200	1,400	1,600	1,800	2,000	2,200	2,400
	3	1,200	1,500	1,800	2,100	2,400	2,700	3,000	3,300	3,600
	4	1,600	2,000	2,400	2,800	3,200	3,600	4,000		
	5	2,000	2,500	3,000	3,500	4,000				
	6	2,400	3,000	3,600						
	7	2,800	3,500							
	8	3,200	4,000							
	9	3,600								
	10	4,000								
3/4	4								4,400	4,800
	5								5,500	6,000
	6				4,200	4,800	4,500	5,000	6,600	7,200
	7			4,200	4,900	5,600	6,300	7,000	7,700	
	8			4,800	5,600	6,400	7,200	8,000		
	9		4,500	5,400	6,300	7,200				
	10		5,000	6,000	7,000	8,000				
	11	4,400	5,500	6,600	7,700					
	12	4,800	6,000	7,200						
1	7									8,400
	8								8,800	9,600
	9						8,100	9,000	9,900	10,800
	10						9,000	10,000	11,000	12,000
	11				8,800	9,900	11,000	12,000	12,100	13,200
	12				8,400	9,600	10,800	12,000	13,200	14,400

economies may come from large production in standard sizes, nevertheless the basic principles have been established and will be discussed under the following headings: grade selection; moisture content; preliminary machining; glues, selection, preparation and application; pressures required and methods of clamping; wood preservatives and laminations.

The making of curved laminated timbers has often been located near the point of use or in areas of concentrated population. Economy and efficiency would seem to dictate that straight laminated timbers of standard stock sizes can best be made at or near the area of original lumber production, where the raw materials can be diverted into the most desirable sales channel, either as standard lumber or as laminates.

Grade Selection

Since it is well known that the extreme compression stresses and the maximum tensile stresses occur at the top and bottom layers of a laminate, these outer layers will require the best grades of lumber. The inner layers progressively toward the center, may be of lower grades, as the loading stresses become of less importance. The economies in such grade segregation may be substantial.

In laminated ship keels and stems, white oak may be used for the outer layers while the inner layers may be of soft wood. Prime white oak is scarce and can be most useful where the heaviest loads are imposed.

Table 2. TUBULAR PRESSURE REQUIREMENTS
Based on hose with 2½ inch internal diameter

Description	Extent of Inflation of Hose				
	A 0	B ½"	C 1"	D 1½"	E 2"
Inside diameter, estimated					
Horizontal, inches	3.93	3.64	3.36	3.07	2.79
Vertical, inches		.50	1.00	1.50	2.00
Pressure capacity, determined					
Lift per linear inch, lbs. (1)		357	312	230	144
Effective area, sq. in. per linear inch at 100 lbs. sq. in. pressure		3.57	3.12	2.30	1.44
Percentage of efficiency of hose contact, when distributed over 4" width of wood (2)		89	78	58	36
Hose pressure required for following specific pressures against wood on 4" width					
50 lbs per sq. in.		56	64	86	139
100 lbs. per sq. in. (3)		112	128	172	278
150 lbs. per sq. in.		168	192	258	417
200 lbs. per sq. in.		224	256	344	556
250 lbs. per sq. in.		280	320	430	695

(1) Lift per linear inch of hose determined in a Merrit Hyrdoplat, with 100 lbs. gauge pressure in hose.

(2) Effective area ÷ 4 × 100; e.g. 3.57 ÷ 4 × 100 = 89 per cent.

(3) Required hose pressure = required specific pressure ÷ percentage of efficiency; e.g. = 100 ÷ 89 × 100 = 112 lbs.

Moisture Content

Successful gluing can be done up to about 17% m.c., providing the differentials between adjacent layers are of the order of 1% to 2%, m.c., which is a basic rule in all laminated constructions. The moisture content at the time of gluing should be, as nearly as can be determined, that which the laminated timber will attain in service. For outdoor exposure this is likely to be from 12% to 15%; for semi-protected locations (roof framework, structural members in unheated warehouses and hangars) around 10% to 12%; and for wholly protected interior locations of the order of 7% to 10%. The point at issue is to minimize major dimensional changes (shrinking and swelling) which may impose undue stresses on the glue joints. Consideration must be given to the moisture added by the glue solvent, which will increase as the laminations become thinner.

Preliminary Machining

Freshly planed surfaces make better and stronger glue joints than can be made when boards, to be laminated, are allowed to stand ground for days, weeks or months. Aging is likely to raise the grain; to cause warping or cupping as well as to allow dust and other impurities to accumulate on the surfaces. All or any of which reduce gluing efficiency.

Every layer should be of uniform thickness throughout its entire area. Planer knives should be sharp and free cutting; dull knives that tend to burnish the surfaces should be avoided; and sanded surfaces are inferior to clean knife-cut surfaces for gluing.

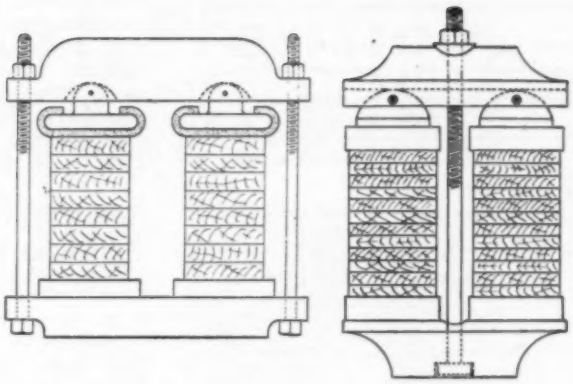

Fig. 1. Screw clamps for laminating timbers.

The ratio of tool marks should not be less than 16 per lineal inch, determined by calculating the linear arc of each cutting knife in relation to the speed at which the board is moving through the cutting zone.

An ideal way to reduce the time between planing and applying the glue is to locate the glue spreader next to the planer, and operate the two machines in tandem.

End joints between boards in the same layer should be scarfed and glued before laminating. In location where bending moments are important, such scarfs should have a slope of not less than 12 (length) to 1 (thickness), but this ratio may be substantially reduced under column loading. Scarfed surfaces should be clean cut on a true angle, with a slightly blunt point to insure adequate pressure at the thin end. Scarfed joints, after gluing, should be surfaced off to standard thickness when the layer is planed. Many attempts have been made to develop a non-sliding (or anchored) scarf that can be glued at the same time as the laminates, but they have not been particularly successful. Edge joints, which lie in a plane vertical to the direction of stress, need not be glued, but they should fit snugly. Often it is convenient to glue them for easier handling as well as for planing the layer to a uniform thickness.

The frequency of end scarfed or square joints, in adjacent layers, requires careful consideration. They should be distributed as far apart as practicable and never concentrated. Well made scarf joints may reduce the ultimate safe load by as much as 10%, but seldom exceed that limit.

Glues—Selection, Preparation and Application

Most laminated timbers are glued with casein glues or with resorcinol-formaldehyde resin adhesives. Casein has been used for many years, and excellent service records have been made on bridge constructions in Europe, where glue joints still appear sound after 20 and more years of weather exposure. Resorcinol is more water resistant than casein, and is favored by the United States Navy for marine constructions. While resorcinol will cure at 77°F. and up, most Navy specifications require conditioning room temperatures of 150° to 200°F. for maximum waterproofness. Casein glues can be used at temperatures of 60°F. or even lower, but the clamping time requirements are prolonged at temperatures

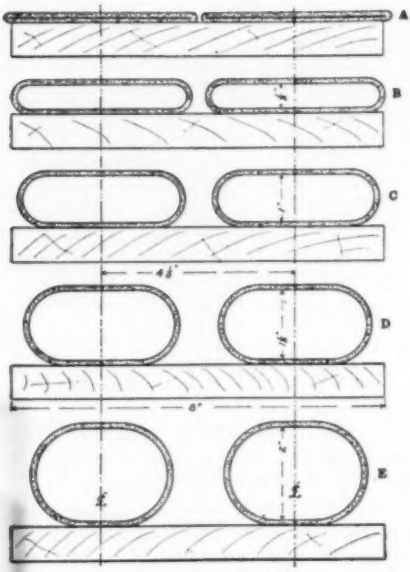

Fig. 2. Graphic representation of contact areas of partially inflated 2½" hose.

below 70°F. In fact casein glues may be used for field gluing on the erection site, providing that proper pressures can be supplied. On the other hand, satisfactory work with resorcinols requires the careful control of temperature, which usually means air conditioned factory buildings. Other glues, animal, starch, urea, etc., which have nominal or moderate water resistance, are not considered suitable for laminated timbers which have any exposure hazards.

Glue is usually applied by passing the boards between grooved rubber rollers. Single spreading, or one glue application per joint, is sometimes adequate, but double spreading is far safer on the average job. In single spreading, alternate layers are passed between the glue rollers; while double spreading (which results in a glue coating on each face of every joint) is accomplished by passing every layer through the spreader. In the latter case, waxed paper is used to prevent adhesion to cauls, blocking or clamp faces. The following table shows the customary range of glue spread, in terms of pounds of liquid mixture per 1,000 square feet of joint:

Type of Glue	Single	Double
Casein	60-90 lbs.	75-110 lbs.
Resorcinal	40-60 lbs.	50- 75 lbs.

It is to be noted that the total requirement in double spreading is about 25% higher than in single spreading. Tests of spreading ratios should be made by coating samples of one square foot area, weighing the identical samples before and after spreading, with the necessary calculations.

Assembly time limits vary with different mixtures, but a safe rule is to be sure that pressure is applied before the glue has ceased to be "tacky" to the touch.

Pressures Required and Methods of Clamping

Under approved manufacturing practice, satisfactory joints can be made, where either or both adjacent layers are of soft wood, with specific pressures of 100 lbs. p.s.i. Higher pressures are required where both neighboring layers are of high density species, such as oak.

In clamping curved laminates, the pressure will have to be greater, to overcome the "back" pressure caused by bending, which must always be added to the applied pressure, to assure a net specific pressure of 100 lbs.

The usual methods of pressure application are by means of screw clamps or of inflatable hose, the latter being a relatively recent development. In the case of the screw clamp, the preferred

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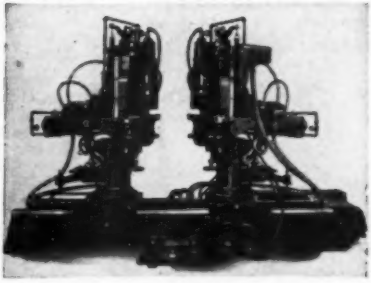

For manufacturers making chairs, radio cabinets, parlor frames, tables, bedroom or other furniture—this Bell 24 is a top-flight money-maker. Saws and bores or saws and chucks both ends at once, as high as 1500 per hour when fed two pieces at a time—or 750 to 1000, one piece at a time. In addition to speed, the work is done accurately — assembly goes faster, spoilage is minimized. Set-ups average about 20 minutes.

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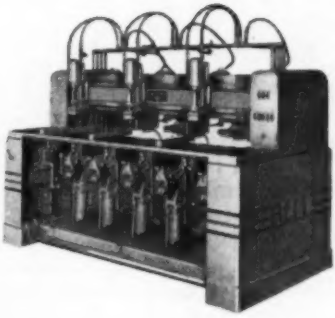

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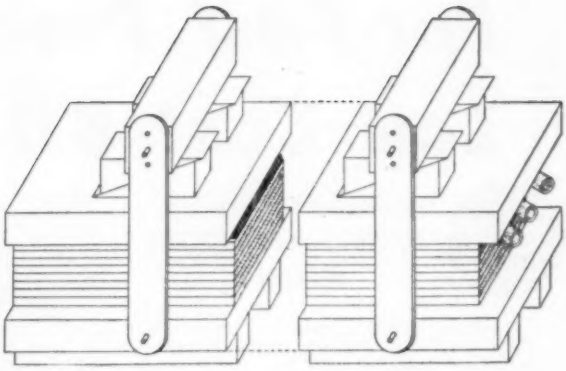

Fig. 3. Application of tubular pressure by inflatable hose. Screws or clamps may be used alternately instead of wedges.

types are shown in Fig. 1. The equalizing cushions under the clamp face, in the double screw type, are desirable to take up any differences in aggregate thickness, no matter what type of twin clamp is used. The double bolt type of clamp is the most desirable, since the single bolt type imposes a heavier load on the screw.

Clamps should have faces of adequate size, as is shown in Fig. 1, to distribute pressure over the full width of the laminated member. The relationship between the thickness of the caul (or of the outer laminate layer) and the spacing between the clamp centers as shown in the following table, has been found satisfactory.

Thickness of Caul or Outer Layer	Center Spacing for Clamps
1½"	15"
¾"	9"
⅜"	4"

The clamp screws must have adequate pressure capacity to provide the recommended pressures at these centers, or the distance between centers correspondingly reduced. When using screw pressures for room temperature work, it is important to re-tighten the screws at intervals to maintain adequate pressure until the glue has attained its permanent grip. In curing chambers at elevated temperatures, and with constant humidity, this re-tightening is not required.

Clamp pressure requirements for different spacings and widths are in Table 1. Clamp screws should be calibrated with a compressometer (manufactured by Black Brothers, Mendota, Illinois) with a given radius of wrench leverage, which should always be observed. Torque wrenches (such as manufactured by P. A. Sturtevant, Addison, Illinois) provide a registering arc to indicate applied pressures. Under all conditions, screw threads should be kept clean, free from defects and well oiled.

In tightening clamp screws, the pressure application should be started at the center of the assembly and progress simultaneously toward both ends, a procedure that is mandatory on curved laminates. Straight laminates may start at one end and progress toward the other. Irregular clamping must be avoided. In all instances pressure should be made effective while the glue or adhesive is still "tacky" to the touch.

The newest technique of applying tubular pressure to laminated timbers is more readily and accurately regulated, but requires a basic knowledge

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. . . out of your Glue Mountain

No problem is a little one—when it's our own! And if your have a glue problem that looks like a mountain to you, our only hope is that you'll let us help you make a molehill out of it.

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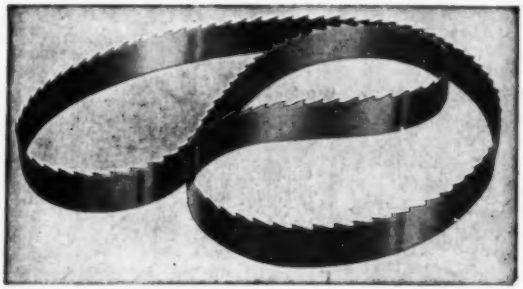

VICTORY CARBIDE SAW & TOOL CO. 3856 N. Ashland Ave., Chicago 13, Ill.

West Coast Repr: H. J. Komorous, 1881 Sunnyvale Ave. Walnut Creek, Cal.

Southern Repr: Memphis Machinery & Supply Co. 250 S. Front St., Memphis 1, Tenn.

of the effective clamping area of partially inflated tubes. Available hose for tubular pressure is usually 2½" inside diameter and designed for a maximum pressure of 400 lbs. p.s.i. When fully deflated such hose is a trifle over 4" wide and can best be used for 4" multiples of width in laminates. The effective contact area of tubular pressure is graphically shown in Fig. 2, and the net effective results are shown in Table 2.

Since it is important to keep the hose as flat as possible, supplementary devices are needed to take up any "slack" in the clamping mechanism. One method to accomplish this is shown in the double wedge process indicated in Fig. 3. Since heavy head plates and cross blocks can be employed, the points of pressure application may be further apart than indicated for screw clamp pressure. Since tubular pressure can be automatically controlled, at any desired point, it can be applied rapidly, and a continuous pressure maintained until the glue has attained a firm grip on the wood.

Wood Preservatives and Laminations

Since large timbers, either solid or laminated, often require treatments with preservatives to resist and retard deterioration in the wood itself, some additional problems may be encountered. Authorities are not agreed on the "treatability" of laminated timbers, or on the "gluability" of preservatively treated lumber. In any event there must be chemical compatability between the preservatives and the adhesives. Excellent results have been secured in gluing treated lumber with resorcinol adhesives, where such compatability existed. Laminated timbers can also be successfully impregnated, although the cured glue lines offer some obstruction to the penetration of

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HIGH FREQUENCY GENERATORS AND EQUIPMENT

BOND WOOD PERMANENTLY IN A MATTER OF SECONDS!

THE OLD WAY at Royal Wood Products Co. Until the wood gluing department was streamlined by installation of THERMATRON equipment it retarded allover production. Two men worked on one assembly, which involved timetaking manual adjustment of clamps, including protective measures to eliminate clamp damage on expensive veneers.

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THERMATRON High Frequency equipment sharply reduces unit production time, floor area and manpower needed . . . eliminates expensive clamps and most rejects. *And,* THERMATRON frequently permits construction that reduces the number of reinforcing blocks which only add dead weight and bulk!

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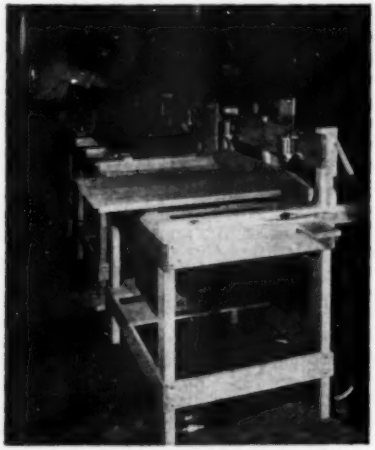
For "non-headache" wood gluing outline your problems to us today. Our engineers will gladly make recommendations without obligation . . . And be sure to request our latest bulletin No. WD-3



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Standard stock generators available from ½ KW to 6 KW output, operating on 110 or 220 Volt lines. Special units supplied for unusual applications.

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the preservative. More practical experience is required to establish acceptable procedures.

Conclusions

The Central Committee on Lumber Standards, co-operating with the United States Bureau of Standards and the Forest Products Laboratory, consider this project of laminated timber of sufficient importance to appoint several committees to study the problems involved. Much of the above data will undoubtedly be incorporated in this program, although no techniques have, as yet, been formally adopted.

Standard laminated timbers of scheduled dimensions and grades are definitely under consideration, and will become a factor in the lumber industry of the near future. This article might be considered a preview of what is ahead in this field.

The End

INFORMATION, PLEASE

Information is being sought of the whereabouts of Stanley Edward Hawkins on behalf of his wife, Olga, and two children, Mary Margaret and Linda Joan. Mrs. Hawkins and the children are living in New York City at the present time. Stanley Hawkins was born Feb. 20, 1917, New York City. He is 6 ft. 1 in., weighs 175 lbs., brown hair and hazel eyes. He was employed as an operator on a woodworking machine. Anyone aware of this man's location is requested to communicate with the National Desertion Bureau, 105 Nassau St., New York 38, N.Y.

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Exclusive double thread of TWIN-fast Screws doubles the thread pitch . . . enters the material twice as far for each turn of the driver—*without extra effort*. Result—

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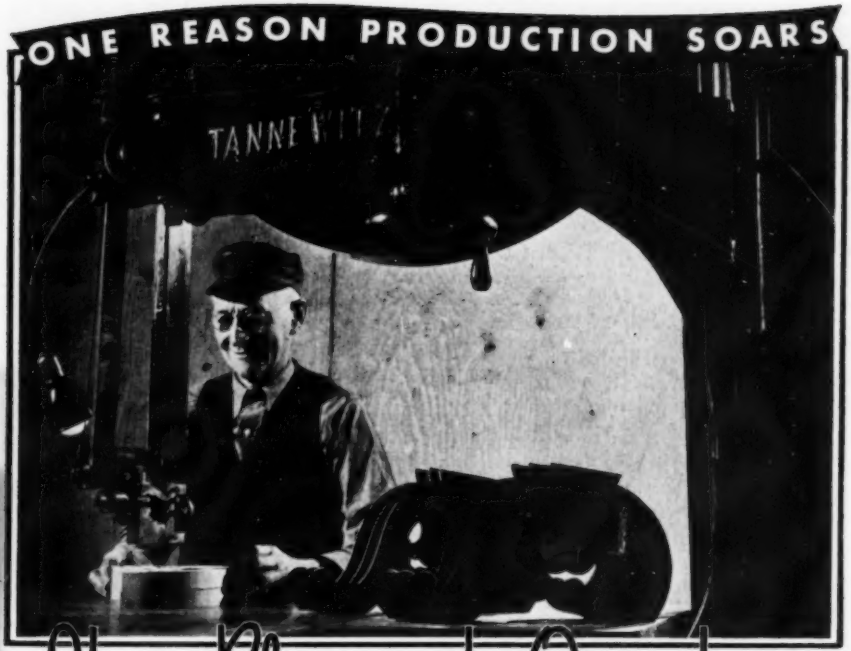

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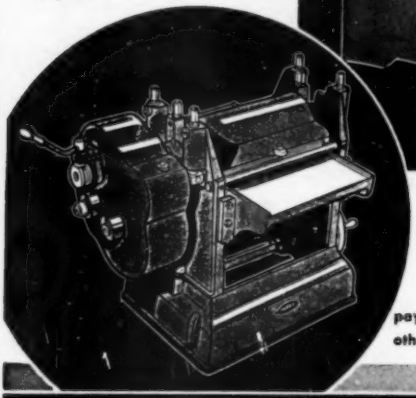
A modernly designed, low-priced, high-speed 20" x 6" planer that meets the surfacing needs of every type of woodworking shop. Ruggedly built for vibrationless operation—assuring quality work, increased production and low operating costs. Provides two feed speeds —20 and 40 F. P. M. and 40 and 80 F. P. M. Four-knife cutterhead has speed of 3600 R. P. M. Complete descriptive literature on request.



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A compact, sturdy machine that offers mill planer precision and ruggedness at a sensationally low price. A real heavy-duty 12" x 4" planer that can pay for itself in savings effected through the salvage of otherwise waste stock. Write for descriptive catalog sheet.

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QUICK FACTS ON BIRCH

FROM THIS SERIAL STORY OF HARDWOODS BY

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IN 1860, CHARLES FOSTER, AN ENTERPRISING YANKEE FROM MAINE, MANUFACTURED THE FIRST TOOTHPICK MADE IN AMERICA. HE LEARNED THE ART FROM LATIN AMERICAN NATIVES WHILE A MERCHANT THERE. LIKE MOST TOOTHPICKS TODAY, THE ORIGINALS WERE MADE FROM WHITE BIRCH.

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Know your wood

BIRCH

BY NED BAILEY

ANYONE identified with the woodworking industry should be well acquainted with birch in one form or another. When I went to school it was upon occasion applied, in switch form, when the teacher wanted to correct or chastise a pupil. In many instances it was applied to the seat of the pants, which possibly explains my familiarity with this specie. I sometimes think it would be well for the present generation if this method were still in use.

The Indians in both North and South America used the bark of this tree, as did the famous Paul Bunyan, to fashion their canoes, which speaks well for its toughness and flexibility. Another well known product, the tooth pick, was made of white birch as far back as 1860 by one Charles Foster, a resident of Maine. Charlie learned how to make these handy items from Latin American natives.

There are several specie of birch that have commercial value, a few of which due to their bark make attractive trees in the field and for landscaping purposes. Probably the most abundant of all our native birches is the yellow birch with an estimated stand of 10,000,000,000 board feet, producing a lumber cut of approximately 145,000,000 board feet annually.

It is used for furniture, packing boxes, button molds, wheel hubs, flooring, veneer, interior finish, wooden ware, agricultural implements and many other purposes. Areas of greatest commercial abundance are Wisconsin, northern Michigan, New England and New York.

A lustrous, silvery yellow bark on limbs and young trunks makes yellow birch easy to identify. On all but very young trees the bark peels into thin papery strips that give a ragged appearance. The bark on old trees is marked by horizontal lenticels or pores, is gray or even blackish, deeply and irregularly grooved and about half an inch thick. Mature trees average from 60 to 100 feet in height and have trunks from two to four feet in diameter regulated by the qualifications of the location.

The twigs are green and hairy at first, turning light orange-brown during the first summer, later becoming smooth and dark. Attached by short, grooved stems, the leaves are pointed, with sharply double-toothed margins and have a wedge-shaped base. Dull dark green above, they are yellow-green beneath with hairs on the veins, and are three to four inches long and one and a half to two inches wide. At the sides of the twigs the solitary, stemless pistillate or seed-producing flowers appear, by autumn these develop into scaly

seed-bearing cones about an inch in length.

Sweet birch or black birch as it is also known, is found on the rich well drained uplands from southern Maine through New York to eastern Ohio, southward to Delaware and along the Appalachian mountains to northern Georgia and Alabama. It reaches its largest size in eastern Tennessee on the western slopes of the southern Appalachians. The name "sweet birch" is applied because of the fragrant wintergreen flavor of the inner bark. The "black birch" description comes from the fact that the bark of the mature tree is nearly black. The bark on the older tree is from ½ to ¾ inch thick, and beside being dark reddish brown or almost black is furrowed and broken into thick irregular plates.

The wood of the sweet birch is strong, hard, heavy, close-grained, has high shock resisting ability, and weighs 48 pounds per cubic foot. Its principal uses include general millwork, boxes, crates, spools, bobbins, novelties, woodenware, fuel, motor vehicle parts and furniture. In small quantities it is used for pulpwood. Sweet birch is one of the most important hardwoods for distillation in the production of wood alcohol. Distillation of the wood, bark and twigs also produces oil of birch, a substitute for oil of wintergreen used for flavoring, while birch beer is made from the sap. Since this oil is far more abundant in birch bark than in the wintergreen herb, the former has largely replaced the latter as a source of natural wintergreen.

Birch is among the woods used for the production of by-products by distillation, three of which are: one, noncondensable gases; two, aqueous condensate-pyroligneous acid and tar, commonly called "green-liquor"; and three, charcoal as a residue in the retort.

River birch as the name implies grows

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Cut to size . . .

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AUTOMATIC SADDLE SEAT MACHINE

SIX TO TEN SEATS PER MINUTE

CONTINUOUS PRODUCTION HOPPER FEED

The McKnight No. 1-E Saddle Seat Machine cuts six, eight or ten seats per minute. It is the highest speed and most efficient saddle seat machine manufactured. Stock is carried from the hopper to the cutting head by a steel chain. Motor, 10 HP, 3600 R.P.M., ball bearing type. Cutting Head runs at 5000 R.P.M., is mounted in ball bearings. *Write for further details.*

Manufacturers of Combination Horizontal and Vertical Boring Machines — Trimming, Chucking & Boring Machines — Single Drum Sanding Machines — Corner Block Machines — Chair Clamps — Notching Machines — Single End Tenoners — Bending Equipment (including Steam Boxes, Pumps, Benders) — Mortisers.

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GARDNER, MASSACHUSETTS, U. S. A.

best along stream and river banks on the shores of ponds and swampy forest land. It is sometimes called red birch because of its cinnamon-colored bark which has a somewhat metallic sheen which separates into ragged papery scales. The bark on more mature trees on the upper trunk and branches go from pale cinnamon to a silvery gray. Because of its graceful form, this tree is well suited for ornamental purposes.

The river or red birch is of comparatively small commercial importance because of its scattered distribution and is used largely in the locality where it is grown. Among the locally made products are cheap furniture, turned articles, shoe lasts, wooden shoes, yokes, berry baskets and wagon hubs. Hoops for peach baskets and rice casks are made from its branches in the south where it grows.

Gray birch resembles closely paper birch and is found growing in the same general area in the northeastern part of the country as far south as eastern Delaware and West Virginia. Like paper birch it is easily worked with tools and because of its fine, soft, even texture it is an excellent wood for turning, however, because of its small size, gray birch has little commercial value.

Paper birch is probably the most widely distributed of the world's thirty varieties of birch its creamy white stem identifying it for most of us as the tree from which Indians built their canoes. Maximum size of paper birch is about 80 feet in height and three feet diameter and it ranges from northern New Jersey to Iowa, through Minnesota and north to the shores of Hudson Bay, into Labrador and New Foundland.

As previously mentioned, Charles Foster of Strong, Maine, was the first American to manufacture tooth picks which art he learned from South Amer-

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Walter of Wabash

ican natives. At first he whittled them out by hand but by 1860 he developed machinery to do the job. By 1940, 3,585,000 board feet of lumber was being used for this purpose, with white birch being the favored wood used principally because of its strength, white color and lack of taste. The stock used must be free from knots and red heart-wood, must be straight and at least 8" in diameter.

Among the important hardwood species used as pulpwood for paper making is the birch. In the past many other hardwoods have been more generally used but recent advancements in technical knowledge is gradually increasing the use of birch and other hardwoods for this purpose.

Veneer for the manufacture of baskets is largely rotary cut from birch logs, sweet, black and yellow being the specia generally used. This preference is made because these woods are flexible and tough, moderately heavy, odorless, light in color and able to retain nails, staples or wire stitching.

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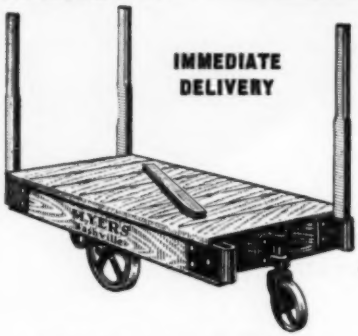
MYERS "TOUGH BUILT" TRUCKS



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WHOLESALE
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HARDWOODS
Specializing in
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Send Us Your Inquiries — Our Shipments Originate at the Better Mills
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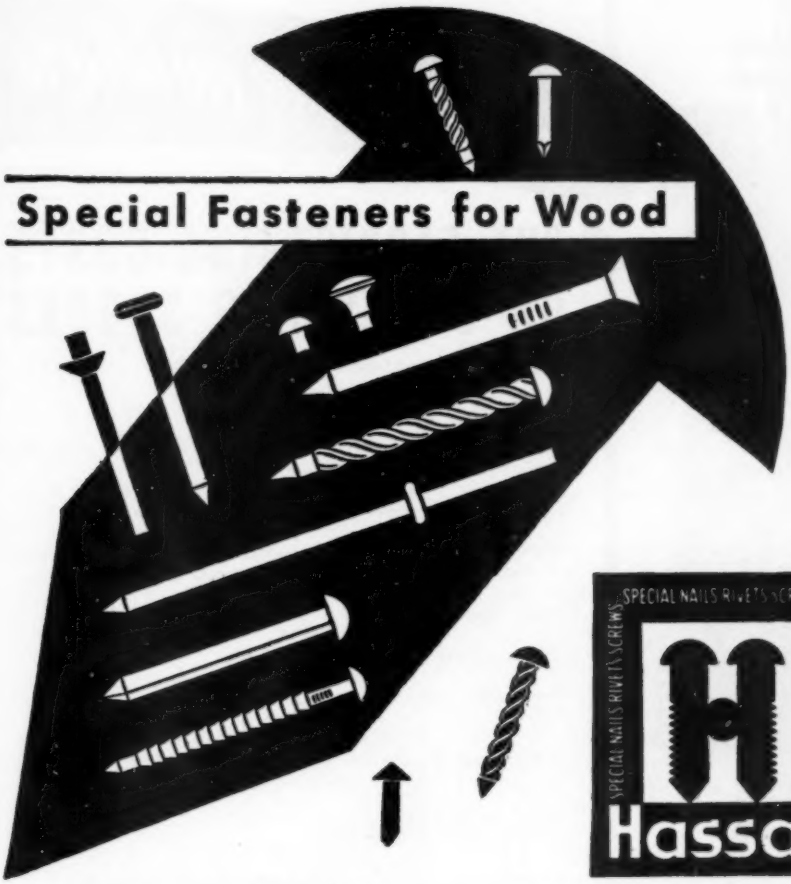

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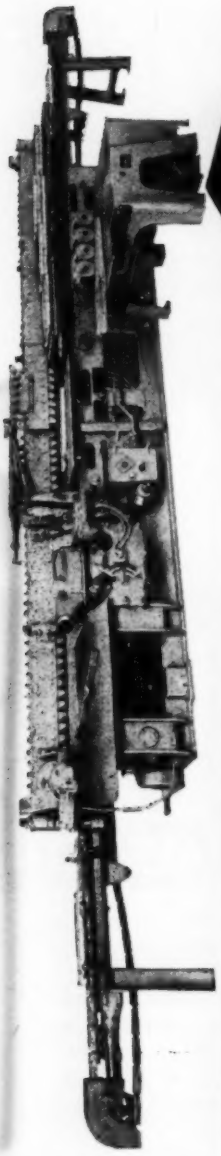
MANUFACTURERS OF COLD-HEADED SPECIALTIES—ESTABLISHED 1850



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CUT FABRICATING COSTS ON BOXES AND SHOOKS

Eliminates separate edging and saw kerf waste.

Straightens irregularities up to ½" with no waste.

Dovetail joints need only 3/32" to 3/16" (you save more than this in edging).

Hot or cold glue—no waste.

Automatic assembly. Tapered dovetails slide into tapered groove. Joint is stronger than wood itself.

Panels sized by rip saw.

Offcut re-used to start another panel.

Production: 2500 or more lineal feet of joint per hour (for 1"-2" stock).

Labor required: Only 4 men—two feeds, one center operator, one helper at saw.

Bark or square edge lumber 1/2" to 3" thick in any length over 10", up to machine capacity.

For the story on how the Linderman Automatic Pre-Fabricator does all this, ask for Catalog No. 945.

MUSKEGON MACHINE Company INC.
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Forest PRODUCTS RESEARCH *Society*

Annual Meeting and Industry Show

THE INDUSTRY SHOW from the standpoint of the majority of exhibitors was considered a success with "high quality registration in attendance." There was, however, not so much heavy woodworking machinery and outdoor logging and sawmill equipment exhibited as had been anticipated. In a well-placed public relations gesture, the Ekstrom-Carlson people, one of the largest exhibitors, expressed their situation in a large placard editorial which reviewed their current production and shipment problem. However, much of the machinery on display was in actual operation, and secondary wood products were rolling off production lines in the machinery area.

WOOD WORKING DIGEST booth near entrance to Convention Hall.

Wood utilization seemed to be a major theme which ran through the exhibits—from wood waste board, new binders and machines offering lower kerf losses.

A unique feature was the world's smallest operating sawmill exhibited by the Simonds Saw & Steel Company. The entire mill was built by Phil Quelch, Simonds British Columbia Field Engineer. The mill is 16 feet long and took 11 years, or 10,000 hours of working time. Complete to the last detail, the mill is operated by tiny levers and push button controls. The logs move from the haul-up to the head band saw. Tiny conveyors move the rough lumber to gang saws, edgers and trimmers. Mr. Quelch's ingenuity is recognized in the adaptations he has made of scrap metals. These parts include pieces taken from old sewing machines, pianos, cream separators and even a baby carriage.

We believe every one of the displays deserves mention. Unfortunately space limitations prevent our covering the show booth by booth. Many of the exhibitors had put time and money into attractive educational displays. Special mention should go to some of the adhesive companies who made glue rather a glamorous object. These displays

For Clean, Flawless Cutting

The time-tested quality in Stanley Bits and Cutters is your best assurance of fast, effective routing and shaping. Efficient designs are machined to close tolerances from the finest high-speed steel. They cut cleanly for long periods without resharpening. Wide variety of styles includes special models with carbide tips. Ask for Stanley Bits and Cutters at your dealer's. Or write today for complete catalog. Stanley Electric Tools, 433 Myrtle Street, New Britain, Connecticut.

STANLEY

Reg. U.S. Pat. Off.

Hardware, Tools, Electric Tools, Steel Strapping, Steel

Roy M. Carter, President.

showed many of the products made with glue and emphasized the importance of good bonding to the entire industry.

Especially helpful, we believe, was the arrangement of exhibits into "Quiet," "Noisy Indoor," and "Outdoor" areas. A man who was showing a moisture register or dry kiln equip-

W. Burdette Wilkins, Northeast regional board member.

ment did not finding himself screaming above a machine running at full speed. Throughout the day a continuous showing of films was held in the Convention Hall theater. These had been carefully selected and proved educational to many attending the show.

Noticeable also was a trend to show uses of wood with other materials in combination. For example, plastic laminate table tops, paper honeycomb cores, use of hardboard plus wood, paper cross banding, substitution of paper for

Kenneth G. Chesley, First Vice President.

wood veneers and a curled shaving core process for hollow core doors.

The percentage of young men attending this show compared to previous years indicates that the Society is appealing to and getting the interest of young men in the industry.

Last month WOOD WORKING DIGEST carried the complete program of technical sessions. On the whole these were well received by those who attended. From time to time we shall reprint some of these papers so that all of our readers may hear of these

APPLY GLUE

Faster - Cheaper - Better

WITH

GLUETOOL

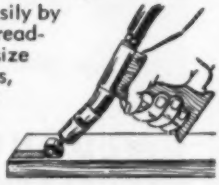
Engineered to Meet Your Own Plant Requirements

Gluetool is a scientifically designed, automatic, air pressure applicator for cold glues such as National Adhesives' Wood-Lok. Applies glue twice as fast, twice as easy with no muss. Steps up production, saves money, improves quality. Adaptable for use anywhere for one or more operators.

Advise us about your gluing set-up and we'll be glad to offer, without obligation, suggestions on how GLUETOOL can best be used to meet your individual plant requirements. Prompt delivery on most models.

Handy-Grip Glue Spreaders

Can be operated easily by unskilled labor. Spreader heads for all size dowel holes, grooves, mortises, flat surfaces, etc. Smooth even flow. Fast. Trouble-free



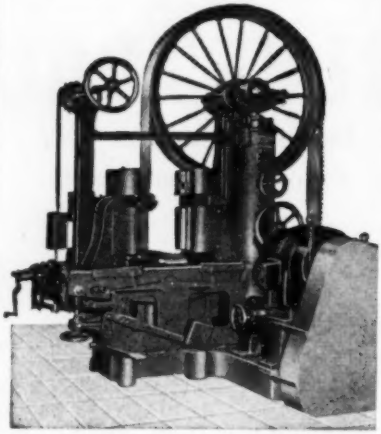
WRITE TODAY FOR COMPLETE DETAILS

GLUETOOLS, INC.

1930 N. Meridian St. Indianapolis 2, Ind.

McDONOUGH 54"

VERTICAL BAND RESAW



New Model! New Features!

- √ Variable gear drive for feed rollers. 40-225 lin. ft. per min.
- √ Heavier wheels.
- √ Larger shafts.
- √ Timken Bearings.

McDONOUGH
MANUFACTURING CO.
Incorporated 1888
Eau Claire, Wisconsin
World's Largest Producer of Band Resaws

Fred R. Armbruster, Northwest regional board member.

new developments and processes.

Annual Business Meeting

The annual business meeting of the Society was held Tuesday evening, May 8 at the Ben Franklin hotel. The secretary reported an increase in paid members from 2022 to 2267 during a 13-month period.

The resolutions committee, acting

R. D. Pauley, Second Vice President

upon a suggestion by Mr. C. D. Dosker of Gamble Bros., Louisville, recommended that the Society write to the office of the Secretary of Defense to encourage classification of men on their enlistment records who are graduates of either forestry or engineering schools and who have had training or experience in the woodworking industry. This would apply also to those already in service. The purpose of proper classification is to readily identify wood industry technical men for possible future assignment within the armed forces.

James F. Hamilton, past President

New Offices and Board Members

New officers and board members of the society elected for the 1951 fiscal year are:

Roy M. Carter, President—Head of Wood Technology and Lumber Products Merchandising Curricula, North Carolina State College, Raleigh, N. C.

Kenneth G. Chelsey, First Vice President—Director of Research, Crossett Lumber Co., Crosett, Arkansas

R. D. Pauley, Second Vice President—Manager, Development Dept., Weyerhaeuser Timber Co., Longview, Wash-

DEDGIE the Planer Boss Says:—

"The customer is always right—and if he is a good customer he's perfect."

According to that we have had for many years a lot of "perfect" customers for

DETROIT KNIVES

PLANER - MOULDER
VENEER - CLIPPER
SHAPER STEEL

Mills everywhere in the U. S. are regular users of DETROIT Knives because of their uniform temper-long edge holding and high production.

Better knives since 1885

DETROIT EDGE TOOL CO.
3425 WIGHT STREET
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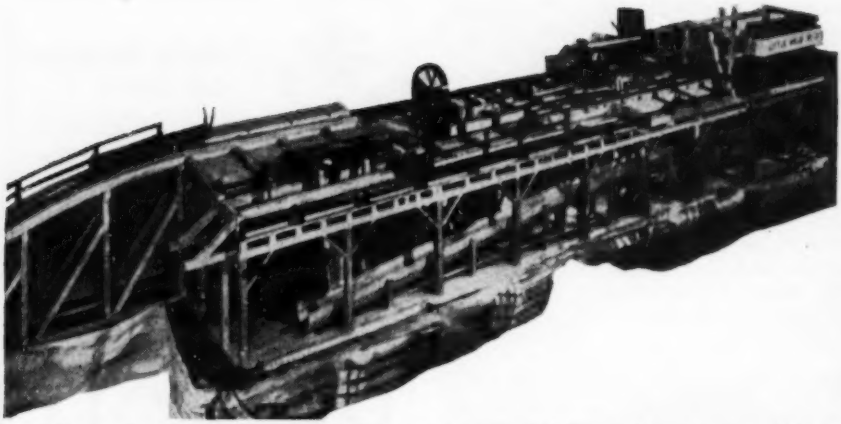


World's smallest sawmill. The complete unit is operated by miniature levers. Miniature logs are made into tiny boards. Details include work safety signs and a whistle.

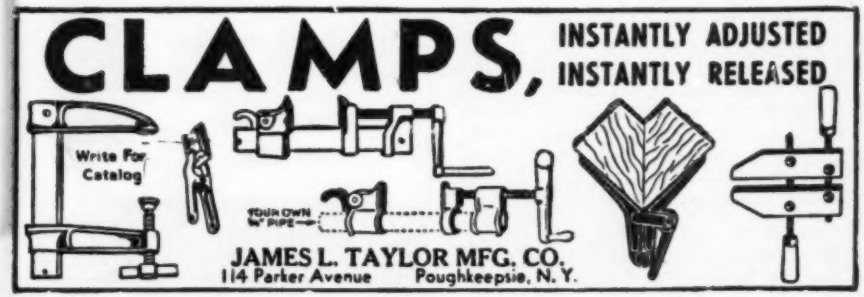
ington
James F. Hamilton, Past President—Cron-Kills Co., Piqua, Ohio
W. B. Wilkins, Northeast regional board member—Consulting Engineer, Ridgewood, New Jersey
Fred R. Arbruster, Northwest regional board member—Manager, Seattle Office, The Dow Chemical Co., Seattle, Washington.

AIR CONDITIONING CATALOG

The equipment needed to do a job of air conditioning: cooling, heating, dehumidifying, filtering, circulating or ventilating; or air handling is covered in a 16-page catalog available from Westinghouse Electric Corporation.

The catalog describes such equipment as hermetically sealed compressors, condensers, water coolers, heating coils, cooling coils, central-plant type completely self-contained air conditioning units, centrifugal fans, v-belt ventilating sets, direct-connected ventilating sets and others.

Write the above Company, Sturtevant Division, Dept. WD, 200 Readville St., Hyde Park, Boston 36, Mass.



World's Finest SAFETY Circular Saw Blade

Woodworking Shops report Excellent results with

PTI SAW BLADE

—the original Laboratory tested Safety Blade—

Pat. Pending

Actual shop tests under production conditions have proven that this new blade offers real safety—plus many other features. The PTI Cut Control Saw Blade is the first and original blade of this type. It was developed by one of the world's foremost saw manufacturers—and then thoroughly tested in the leading shops and laboratories of Europe and America for more than two years. It is the first saw blade of this kind tested by the Forest Products Laboratories, Madison, Wis., Timber Engineering Company, Washington, D.C., the University of Zurich, Switzerland, and other testing laboratories with favorable reports issued in every instance. The PTI Safety Blade is the only genuine safety blade made of chrome vanadium steel.

Offers Many Advantages

With this new type blade—numerous tests have proven that "kick-backs" of all types are not just minimized—they are eliminated. Just as important—if the operator's hand comes in contact with the blade—it cannot be pulled into the blade as with conventional blades—and severe cuts are further minimized by the smooth non-cutting edge between the teeth. Other advantages include: Uses 30% less power; runs silently; stays sharp longer; produces chips, not sawdust; costs no more than ordinary blades. Available in choice of solid teeth and carbide tipped teeth.

Write for Full Details

Send coupon for circular giving full details, specifications and prices on all sizes and types of PTI Safety Saw Blades.

PTI, Incorporated (WWD6)

401 Broadway, New York 13, New York

Gentlemen: Please send me circular giving full story on PTI Safety Saw Blades. Also specifications and prices.

Name .....

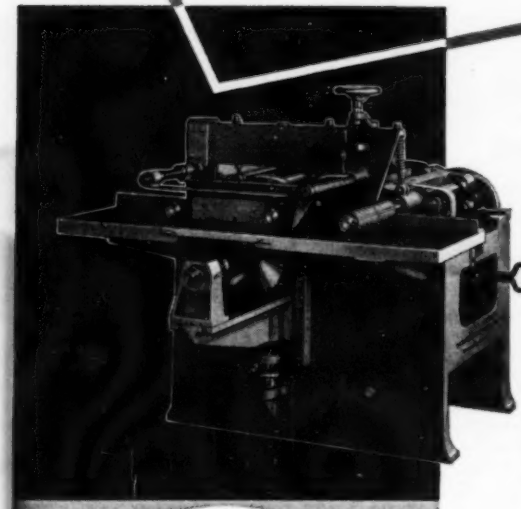
Address .....

City ..... *Zone*..... *State*.....

For the Really *Tough* Jobs . . .

MEREEN-JOHNSON No. 441

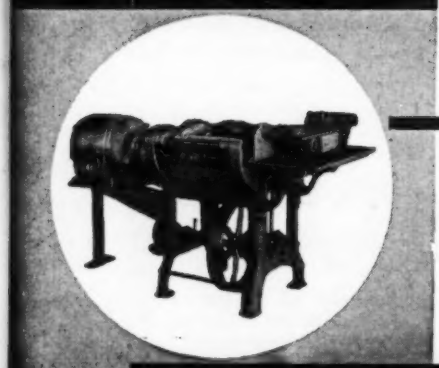
Heavy Duty Gang RIP SAW



- Six *power driven* feed rolls
- Up to 125 HP . . . 12" or 19" saw space
- Variable feed drive up to 300 ft. per minute

RUGGED, powerful—made for fast production on the most difficult gang ripping jobs. Three pairs of power-driven feed rolls really take hold of any class of stock. Kick back stops between infeed rolls eliminate accidents. An exclusive beam type mounting makes the arbor unusually smooth running . . . and this entire arbor assembly is adjustable. Automatic hopper feed is available as an extra.

For complete specifications, write for Bulletin No. 441.



FOR LIGHTER RIPPING JOBS...

MEREEN-JOHNSON

GANG RIP SAW NO. 440

Lighter duty than the No. 441, this machine for sawing cleats can also be used for many other purposes. *Bulletin No. 440 contains the complete data.*

Mereen-Johnson MACHINE COMPANY

4401 LYNDALE AVENUE N. • MINNEAPOLIS 12, MINNESOTA

Wood in the Mobilization Program

By C. Arthur Bruce
Director, Lumber & Wood Products Division, NPA

This paper was presented at the recent F.P.R.S. Annual Meeting. We hope to reprint other speeches dealing with the mobilization program and its influence on the lumber and wood products industry. Let us know of your special interests and we shall try to include them in a future article. — Editor.

AS THE TEMPO of mobilization increases, wood becomes spotlighted as of greater and greater importance. The mobilization program, as undertaken under mandate of federal law, the Defense Production Act of 1950, has as its scope and objective not merely the strengthening of the military might of the United States of America to the point of effective opposition to acts of aggression on our country, but it is a mutual defense pact under the United Nations. And as such supports collective action there in line with our foreign policy objectives.

The mobilization program is a huge one and so big that it is hard to comprehend in its scope and impact on our economy. But there it is and we are already well on the road toward putting the program in high gear.

Wood played a very important part in World War II. It is estimated, and I believe accurately, that in 1944 when we were in the thick of greatest intensity of the war, of every pound of steel expended a corresponding pound of wood was expended. During the first three years of that war direct military took approximately one half our entire available supply of lumber from production and inventory in the hands of the lumber manufacturers and their distributors, wholesale and retail. Approximately one half of the balance went to indirect military, and the balance, or one quarter of the total, to essential civilian use. The term indirect military included wood for housing, furniture, etc. of civilian war workers; wood needed by the farmer in his percentage of production of food and other products, for the military. Essential civilian use included wood for repair and maintenance of railroads and other transportation, utilities, public works, and agriculture in general. The god of war is truly voracious in his consumption of wood.

The term wood as used in this discussion does not include wood pulp nor its end products of paper and paperboard. It does not include the end use of wood fiber for wallboard, insulating board or blanket material; nor does it mean the production of rayon and other synthetic or plastic

BENEDICT *Challenger* GRINDERS

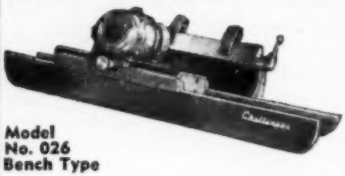
TOPS IN ACCURACY

Made in standard lengths 26", 32" and 38" lengths.
Will handle blades 1/16" to 5/8" thick and down to 1/22" wide.
Precision built for speed and accuracy.

- **Aligning gauge on knife bar**
- **C-clamps cut set-up time by one-third**
- **Carriage does not overhang on bed**
- **Travels on 8 sealed ball bearings**
- **On machine-ground ways**

Model No. 26
Hand Traverse

Furnished with or without coolant tank—Hand or Mechanical Traverse —C-Clamps or Magnetic Holding Bar —Bench or Cabinet Base.



Model No. 026 Bench Type

Write For Folder G-10

Territory available to established Manufacturers Agents.

BENEDICT MFG. CO. BIG RAPIDS, MICHIGAN

products. All of these are used in the war effort in varying degree. But herein our purpose is to consider the lumber and wood products.

This area just about parallels the jurisdiction of the Lumber & Wood Products Division of the National Production Board of World War II. The area includes lumber—rough and finished—millwork, veneer and plywood, flooring, ties, posts, piling, poles, etc., with such finished wood products as shoe lasts, battery separators, etc. Although as a generalization it may be stated that lumber contribution to war is the same as its contribution to peacetime civilian needs, some of these items are very important in war and draw on our forest resources much heavier than in normal times.

For example it is estimated that in the first year after declaration of war we would require in excess of 5,000,000 poles, 75,000,000 lineal feet of piling, etc.

From furniture

Much of the beauty of maple furniture depends on quality of finish. Many manufacturers, dissatisfied with previous results, have found that Jewel Brand Garnet Belts do faster work, at less cost — and give finer finish at same time.

to fixtures

Plywood, used in large quantities for store fixtures and cabinets, can be sanded with amazing savings by using Bondex Garnet Fibre — an extra-rugged Jewel Brand Abrasive that lasts 8 to 10 times longer than ordinary drum covers.

THERE'S A JEWEL BRAND COATED ABRASIVE to do every job, large or small, and to do that job quicker, cleaner, at lower cost!

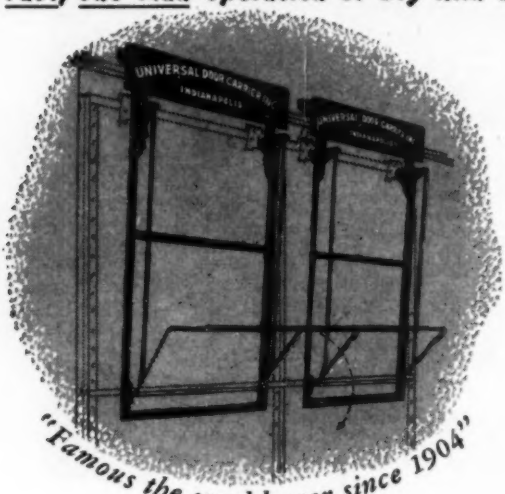
Ask your distributor or write on business letterhead for catalog. Abrasive Products, Inc., 551 Pearl Street, South Braintree 85, Mass.

SHARPER, TOUGHER

Jewel COATED Abrasives

CUT COSTS!

For Fast, One-Man Operation of Dry Kiln Doors



"Famous the world over since 1904"

The Universal DOOR CARRIER

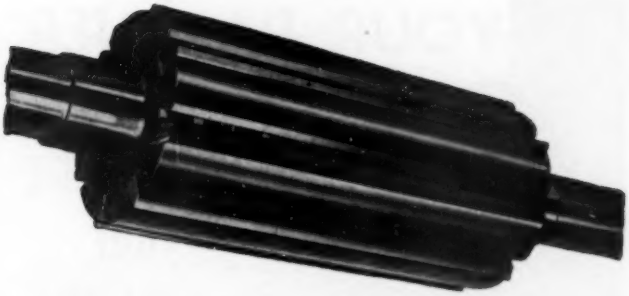
. . . makes removing and replacing kiln doors a simple, one-man job requiring only a few seconds! This fast, efficient method also helps *save your doors* —by supporting the weight uniformly to eliminate stresses and strains, and gentle (though speedy) handling. There's a Universal Carrier to handle any size and weight of door with ease. Let us show you how to reduce your heavy doors to featherweights!

Universal DOOR CARRIER, INC.
1117 Cornell Avenue • Indianapolis 2, Indiana

The reason for wood's importance lies partly in the fact that wood has proved its case in war—wood has proved it can take it. When used for containers for overseas shipment—regardless of material for container: tin, plastics, etc.—final protective covering was of wood. When used in end products there must be elimination of steel parts as a conservative measure and the wood used must be of sufficient structural strength. During World War II wood was the principal raw product of over 1200 different items. These ranged from "prefab" houses, aircraft, furniture on down to tent poles and pins. These may be made of steel and sometimes aluminum. But on the entire list, to what other material may we turn than wood when metals require strict conservation?

Do We Have the Timber Supply?

Do we have in this country a timber supply to meet the potential war de-



Journal Type
ROUND HEADS
to Meet Your Specifications!

BADGER Journal or "Planer Heads" are built in a complete range of sizes for the various types of machines on which they are used . . . Bench Jointers, Jointers, Small Surfacers, Large Surfacers, Timber Sizers and some Moulders. Shafts are extended to the length desired; sized to fit ball or babbitt bearing requirements.

Send sketch with Order or Inquiry giving All Dimensions and Direction of Rotation; also Bearing Number for Ball Bearing Machines.

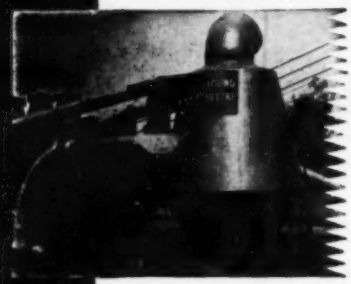
CUTTER HEADS
BADGER
KNIVES

Engineers to the Woodworking Industry

WISCONSIN KNIFE WORKS

BELOIT, WISCONSIN

YOUR PARTNER in increasing your profits



An Adequate Dust Control System

Yes, an adequate dust control system in your plant is the same as another partner working for the good of your business. It improves the efficiency of your machinery and raises employee productivity.

Young and Bertke engineers design and install dust collecting systems that are the last word in efficiency and renovate obsolete or inadequate existing systems so that they do an efficient job for you.

Let us show you how a Young & Bertke Dust Control System can help you increase your output and save you money. Write us today.

YOUNG & BERTKE CO.

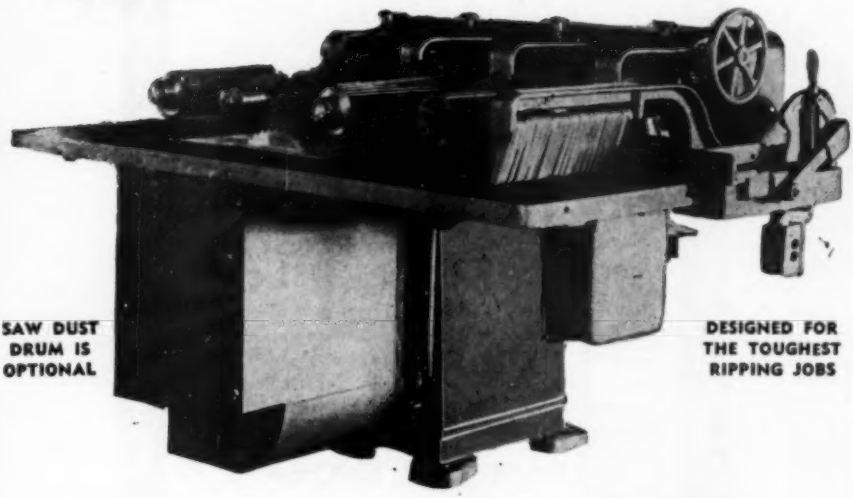
1122 Buck Avenue Cincinnati 14, Ohio

mand? From the standpoint of quantity the answer is yes. The latest Forest Service figures indicate there is an excess of one million six hundred billion board feet of standing timber. The ratio between saw timber removal and growth seems to be in very good balance. Of course, if we need large quantities of timber for a war effort there would be impairment of governmental and private forestry, but it would have to be faced. The reserves of timber on our public domain should carry their share of the load and did in the last war.

In considering supply we must give attention to the woods that may be imported into our country or such foreign woods as might be made to serve in a war effort without process in this country. The importation of foreign woods has become a major factor in the wood using industries in the United

A REAL HUSKY...

NO. 213 A MODERNIZED HOOSIER SELF FEED RIP SAW



SAW DUST DRUM IS OPTIONAL

DESIGNED FOR THE TOUGHEST RIPPING JOBS

FOR QUICK OPERATION - DEPENDABLE PERFORMANCE

This sturdy unit is designed specifically for high speed ripping of stock longer than 24" and as a gang ripper for stock as short as 12". The No. 213 is equipped with a stationary table top having all feed works brackets bolted to the top—as is the gear reduction drive. The mandrel rides on ball bearings and is raised and lowered quickly by a hydraulic cylinder. Eight driven rolls feed the stock through the saw at high speed. A 50 H. P. motor drives this unit at full capacity. The No. 213 is a real workhorse, built to handle your toughest jobs.

Available for direct motor or V belt drive.

SINKER-DAVIS *Company*

230-250 SOUTH MISSOURI ST. DEPT. 0 INDIANAPOLIS, INDIANA

SUCCESSFUL ON HAND FEED MITRE
Now
THIN-KERF
CARBIDE TIPPED
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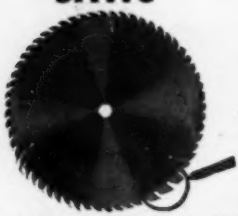
ONLY
1/8 inch
KERF

SAVE UP TO 80 BOARD FEET A DAY
Sensational new carbide tipped saw actually saves as much as 80 board feet of material in an average days operation. As much as $30.00 in savings, in a day. Uses less power, too. Available in 12", 14", 16" and 18" diameters and a variety of tooth specifications. WRITE TODAY FOR INFORMATION AND PRICES.
LEMMON & SNOAP
Saw Specialists
288 Bridge St., N. W. Grand Rapids, Mich.
ELIMINATES CHIPPING OF VENEERED STOCK ★ LOWER
OPERATIONS ★ SWING AND RADIAL CUT-OFF OPERATIONS ★ LESS
IN COST THAN WIDE KERF SAWS ★ DOUBLE CUT

States. In fact we have developed into an importing country rather than an exporting country within the last decade. These imported woods are serving certain industries such as the furniture industry and it is safe to say that there are today more than 100 species which are being used by the furniture industry. Mahogany is one of the principal ones. In 1950 we had an all time high in imports. The trend in 1950 was 10.3 imports to 1.0 exports. During World War II the principal foreign woods used for the war effort were mahogany, balsa, teak and rattan—mahogany for aircraft and boat building, balsa for aircraft and floats, teak for boat decking and rattan for boat fenders. All these species are again entering into the mobilization picture and we can assume they will become more important.

It is in these areas of special woods, both domestic and foreign, that critical shortages may lie. This is the area in which we are concerned with research. When a specie becomes in critical supply, substitutes must be found, and the same is true in substitution of grades.

Can the Lumber and Wood Industry Convert?

Does the lumber and wood product industry have the plant to produce

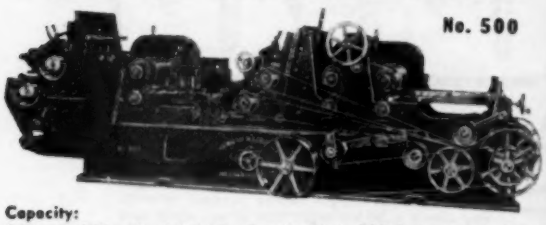
NEWMAN MACHINES

Newman

No. 512

Capacity: 16" and 24" wide, 8" thick. Speeds up to 325 feet per minute. 8" dia. cutting circle. Six 12" dia. feed rolls. Single and double profilers.

BALL and ROLLER BEARING PLANERS AND MATCHERS



No. 500

Capacity: 14" and 24" wide, 6" thick. Speeds 40 to 200 feet per minute. 7" cutting circle. Six alloy steel feed rolls. High carbon special alloy steel cylinders. Single or double profilers.

The ball bearing NEWMAN 71 (shown below) will grind all sizes of cutter heads. Table is 33" long by 9" wide with horizontal travel of 25" and is heavily ribbed to maintain accuracy over entire travel. Maximum cutter head swing is 11".

HEAD GRINDER **No. 71**

ORDER NOW FOR EARLY DELIVERY

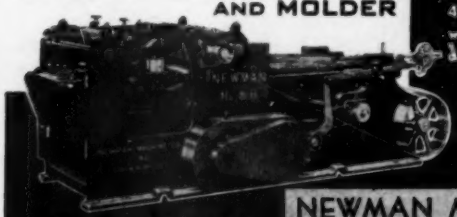
ALL NEWMAN cylinders or heads are DYNETRICALLY BALANCED insuring an accurate and superbly finished product.

Ball and Roller Bearings

No. 55 AUTOMATIC PINEAPPLE FEED TABLE

The NEWMAN 55 feeds stock automatically to high speed planers and matchers up to 450 lineal feet per minute. Capacity: 30" wide, 8" thick. All adjustments and controls are centrally and conveniently located.

No. 8-B PLANER, MATCHER AND MOLDER



Unsurpassed for work in small and medium mills

The NEWMAN 8-B planes 22" wide and 8" thick, joints 4" thick and will match 14" wide. 6" diameter feed rolls. Speeds of 30, 50 and 75 feet per minute.

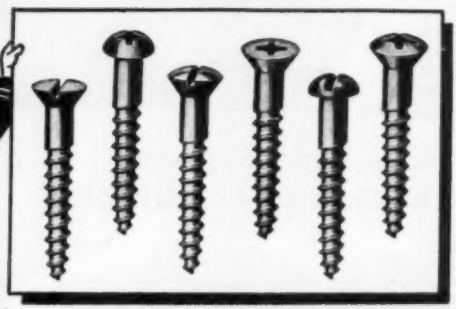
MAY WE SEND YOU FULL DETAILS?

NEWMAN MACHINE COMPANY, INC.
GREENSBORO, NORTH CAROLINA, U.S.A.

Pheoll

WOOD SCREWS

- Reduce Assembly Time
- Join Parts Better
- Improve Product Appearance



Other Typical Pheoll Products

Machine Screws, Tapping Screws, Cap Screws, Set Screws, Stove Bolts, Machine Bolts, Machine Screw Nuts, Phillips Recessed Head Screws and Bolts, Sems (Lock Washer Screws), Special Cold Headed and Threaded Products.

Use of Pheoll standard and special wood screws reduces overall assembly time and provides the means for joining parts tighter and stronger. Also, they improve the final appearance of your products.

These quality screws are made from cold forged blanks—individually turned, providing clean cutting edges free from nicks and burrs. The sharp gimlet-type point penetrates the wood for a straight and rapid driving start. Spiral threads seat firmly in the wood, providing a rigid bond that resists strain and vibration. Pheoll wood screws are available in slotted or Phillips recessed head types—in a broad range of sizes—all head styles, different metals and in all finishes. Ample stocks of steel and brass wood screws are always carried in stock.

Pheoll MANUFACTURING COMPANY • 5700 Roosevelt Road Chicago 50, Illinois

SCREWS • BOLTS • NUTS

Industrial Fasteners and Holding Devices

what is required? Fortunately the industry has no conversion problem at the moment. By and large the products needed for defense are the products needed for peace. This plant of ours is greatly divided in ownership, it being estimated that there are 60 to 65 thousand full or part time sawmills, almost unnumbered finishing shops, 1,500 wholesale distributors and 25,000 retailers. The largest company in the country has never shipped more than a small percentage of the total number of products.

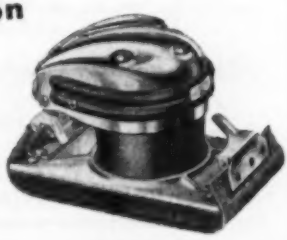
In 1945 it was estimated that there were 5,500 of what might be termed the major mills and these mills produced 77 percent of the total production, that there were 4,500 medium sized to small mills which produced 11 percent of the total production, the balance of 12 percent being what might be termed "in and outers". In peacetime the only limiting factors on lumber production

NATIONAL SANDERS

Speed Finishing Room Production

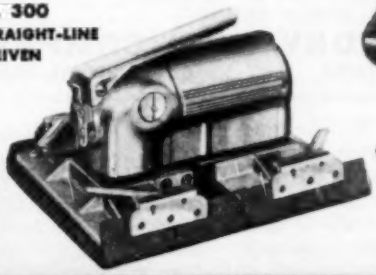
Whether you are rubbing the finish coat, padding in filler, sanding in the white or doing any one of many finishing operations, you will find National Sanders will speed the work and improve the finish. National offers both orbital and straight-line action machines in order to supply you with the type of equipment that will best fill your needs. See your National Distributor, or write us for descriptive literature.

Orbital or Straight-Line Action



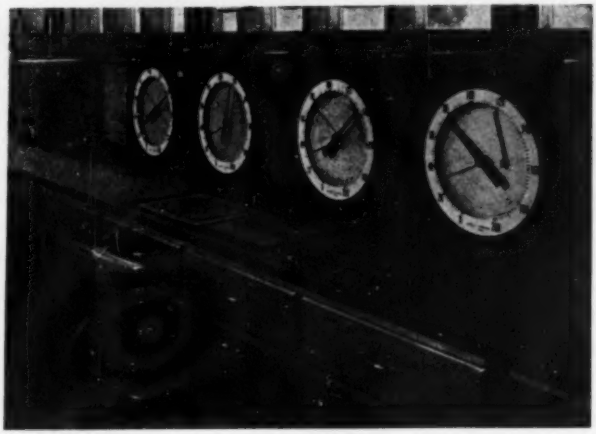
MODEL 400
ORBITAL ACTION — AIR-DRIVEN

MODEL 300
TWO-PAD STRAIGHT-LINE AIR DRIVEN



NATIONAL NS SANDERS

NATIONAL AIR SANDER, INC.
2820 AUBURN ST., ROCKFORD, ILLINOIS



IMRIE
ELECTRONIK POTENTIOMETER . . .
MULTIPLE THERMOCOUPLE SYSTEM

This exclusive IMRIE control system assures SCIENTIFIC . . . HIGH QUALITY drying of lumber. No other system of dry kiln control provides the accurate readings and recordings of temperature and humidity at so many points in the kiln . . . plus really DEPENDABLE AUTOMATIC control. Users of this NEW system report faster . . . unusually safe and accurate drying with very low percentage of degrade. IMRIE DRY KILNS are famous for

- HIGH QUALITY DRYING
- SAFETY AND DEPENDABILITY
- HIGHER PRODUCTIVITY
- LOWER COST OF OPERATION

This NEW type of control system coupled with IMRIE Sipho-Fan Kilns means all Imrie users get "PERFECT DRYING EVERY TIME."

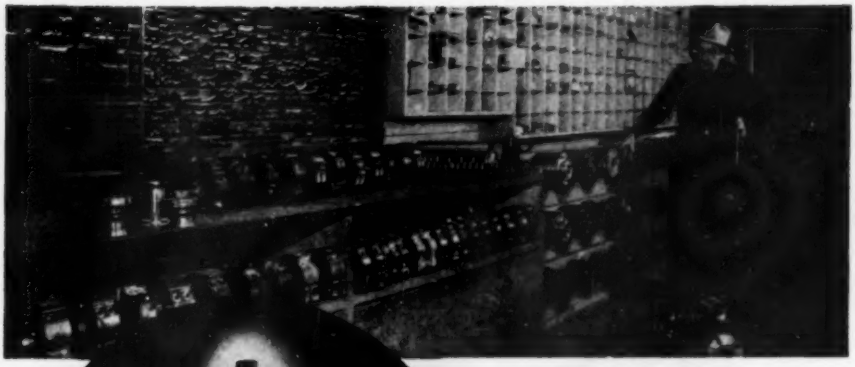
*WRITE FOR YOUR COPY OF "ACCURATE . . . SCIENTIFIC . . . ECONOMICAL LUMBER DRYING."

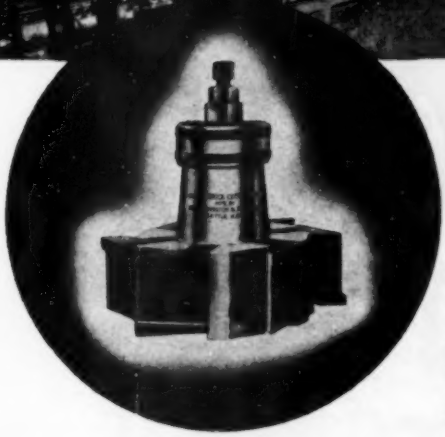
IMRIE DRY KILN COMPANY
PEARL & OTTAWA GRAND RAPIDS, MICHIGAN

are markets and prices. In war time the limiting factors on production are skilled manpower, equipment and supplies. In World War II lumber was in short supply as follows: 1942—17 percent; 1943—12 percent; 1944—7 percent; 1945—9 percent.

At the start of World War II we had an inventory position of 17 billion, today we have between 11 and 12 billion.

Presently lumber production is about at its peak for all time. The problem is to maintain that production because, if war should come, all lumber produced could be used to advantage. One of the purposes of the Lumber and Wood Products Division of the National Production Authority is to obtain the necessary steel and other critical metals and materials without which the lumber industry cannot operate. To do this we are confronted with a real task in education as to the important part that

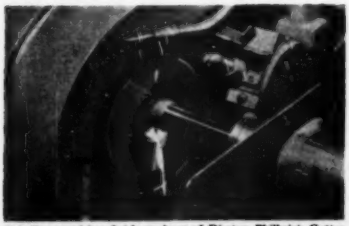




"I've found DISSTON *Philbrick.* CUTTER HEADS *the best!*"

... says Si Hannon—a man who really knows cutter heads. He's been in the milling business since 1916; today, he's the owner of Mutual Moulding . . . one of the oldest custom milling plants in Los Angeles. It's of real significance, then, that Si Hannon uses Disston products throughout his plant. In the photo above, you see him with some of the more than 80 Disston Philbrick Heads equipped with Disston Knives used in his operation.

NOW—BETTER THAN EVER WITH *PRECISION-GROUND* BEARING SURFACES! Get better performance—accuracy and working ease! Now, Disston Philbrick Cutter Heads are precision ground—to .0001 (one ten-thousandth) of an inch—on head bores, on inside and outside of sleeves, on all bearing surfaces between the machine spindle and head, insuring more accurate work! You save money by saving downtime!



Grinding precision finish on bore of Disston Philbrick Cutter Head. Machines used for this grinding are the most modern and accurate of their type.

DISSTON PHILBRICK CUTTER HEADS

GENERATED (MILLED TO PATTERN) TYPE

produce more — more efficiently!

Consider the flexibility! Work a wide variety of patterns with each pair of Disston Philbrick head bodies. Knife changes are quick, simple. No holders, clamps, gibs—no trouble. Save manpower, downtime, material!

Longer Life! Disston Philbrick alloy heads are specially heat-treated to last longer!

Faster feeds, heavier cuts! Thicker knives, greater throat room eliminate overloading and clogging with shavings. Heads pull easily—produce smoother work!

For smoother finish, more footage, lower investment and operating costs—DISSTON PHILBRICK CUTTER HEADS!

HENRY DISSTON & SONS, INC.
695 Tacony, Philadelphia 35, Pa., U.S.A.
Canadian Factory: 2-20 Fraser Ave., Toronto 3, Ont.

lumber plays in mobilization, and the necessity of supplying the industry with the steel for saws and other operating supplies necessary in forest and plant. Further than this, to develop ways and means where we may not lose our manpower and skilled workers to other industries where the work is less arduous and the pay and other conditions more attractive. In other words, we must be a claimant for manpower to avoid repetition of shortages which are bound to occur otherwise. We manufacture a natural raw product which due to the nature of the manufacture does not lend itself to the mechanization of other industries and which on the other hand requires more manhours of labor per unit of production than almost any other industry.

Importance of Research

To my mind the present conditions confront us with a challenge and an opportunity. I remember back when Mr. Axel Oxholm was connected with the Department of Commerce and I happened to be a member of his Wood Waste Utilization Committee. Mr. Oxholm, I believe, was instrumental in

ELECTRICALLY-CONTROLLED
AIR CYLINDER

Complete POWER UNIT
WITH BUILT-IN CONTROLS

THE Bellows electrically-controlled BSM Air Motor is a complete reciprocating straight line power unit. Performs any pull, push or lift operation at a touch of a button. Built-in speed controls give positive control of piston rod speed in either or both directions. No extra valves to buy . . . no expensive piping to install. Only one air connection required which may be flexible hose. Available in 1¼", 2½", 3⅜" and 4½" bores — any stroke length.

Dept. WD 651

Write for Specification Bulletin BSM

The Bellows Co.
Akron, Ohio

bringing to this country certain Swedish patents on timber connectors. The use of lumber in place of structural steel is aided by these connectors. One striking World War II example of steel conservation, made possible by the use of timber connectors, was a Navy blimp hanger 1,000 feet long, 153 feet high and with a roof span of 237 feet. Two thousand and fifty tons of structural steel would have been required. Wood was used in its place at a cost of 200 tons of steel used to fabricate the connectors.

It is my firm conviction that the use of steel in reinforcment of wood is in its infancy. I believe that structural members can be developed where wood is combined with steel which will save not only wood but also steel. When concrete became reinforced it ushered in a new day in that industry. Rein-

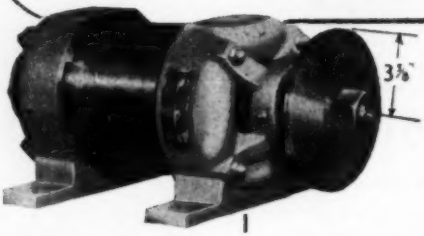
NOTE

ONLY 7 5/8" DIAMETER

IRVINGTON

NO. 41 BALL BEARING MOTORIZED

SAW ARBOR



- Cut-Off, Rip, Compound Angle Saws
- Trimmer Arbors, Saw Grinders
- Whenever small diameter motor is required

3600 R. P. M.
3, 5, 7½, H. P.

1800 R. P. M.
5, 7½, 10 H. P.

3 Phase, 60 cycle,
220 or 440 Volts

- Over-size ball bearings
- Double-end fan ventilation
- Dynamically balanced rotating parts
- Extented end, flush or center mountings
- Right or left hand threads

IMMEDIATE DELIVERY

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forced concrete was actually a new product. Reinforced lumber may be a dream, but if it is to come true men of research are the ones who will develop it.

The fact that the Forest Products Research Society is only a few years old, and has achieved a surprising stature in a short period of time, is, I believe, evidence of the multitude of opportunities for practical product development in wood. These opportunities are a challenge to you as an integral part of our great lumber industry. By and large the lumber industry knows too little yet in a scientific way about its product and what may be done with it so that it may better serve the public. In this research field the lumber industry will of necessity have to util-

ize scientifically trained minds and minds that are not hampered by the traditional attitude of the industry. Minds in fact which, without this handicap of traditional attitude, do not know that it cannot be done, and go ahead and do it.

We of the lumber industry face many problems. With the rest of the world struggling with governments many of which are shattered and with industry disrupted—all other nations apparently however counting on strong and vigorous economy in the United States to help put them through, America is now striving by production to keep its own economy in order, so that we may withstand abnormal demands thereon. To do so it is essential in my opinion that government assist the lumber industry to produce to the utmost. And this frankly is the policy of the division which I now head.

I hope in closing that I have driven home the fact that lumber and wood products are extremely important in defense effort. In driving that fact home I hope that I may have stimulated you to render individually and collectively through the Forest Products Research Society all of the assistance that you can give in putting your shoulders to the wheels, your research shoulders and otherwise, to the end that lumber may continue to serve as we know it will be expected to serve in our mobilization program.

The End

H. W. GRIFFIN

Harry Warren Griffin, president of Taylor-Stiles & Co., died at his home in Riegelsville, New Jersey in April. Mr. Griffin came to Taylor-Stiles & Company after graduating from Cornell University in 1896. He served as secretary and treasurer of the firm before becoming president in 1945.

Ammunition Box Hardware

If your contracts call for hardware for ammunition boxes like that shown here, or for other ordnance equipment—save time by consulting Stanley. The largest manufacturer of hinges and hardware specialities, The Stanley Works has the "know-how" to help you develop the items you need, and the plant facilities to supply them on time.

Send us complete details of your requirements, including prints, if possible. We'll help you meet delivery commitments.

THE STANLEY WORKS • NEW BRITAIN, CONNECTICUT

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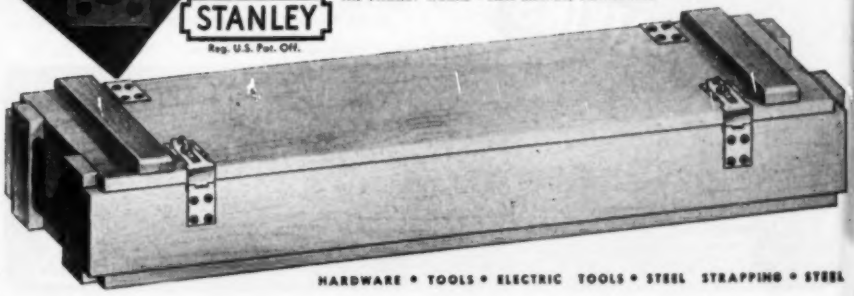
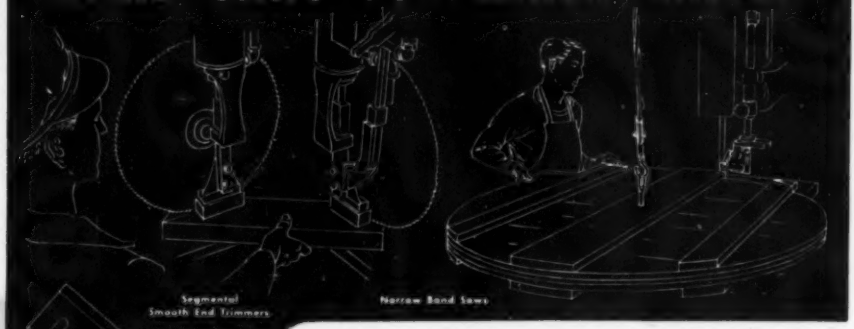
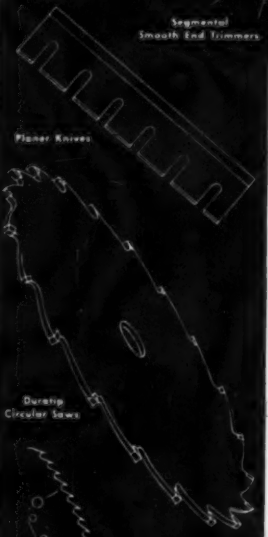
Reg. U.S. Pat. Off.



HARDWARE • TOOLS • ELECTRIC TOOLS • STEEL STRAPPING • STEEL

BAND SAWS TO PLANER KNIVES





. . . if yours are trademarked

"Silver Steel"

you've got the best!

● In every kind of woodworking operation—in big plants and little all over this country—Atkins "Silver Steel" Saws and Knives have proved again and again their claim to increased production and cut costs. For the "hows" and "whys" you'd have to go deep into the science of metalurgy—and study the special processing every "Silver Steel" Saw and Knife receives in Atkins huge modern plants. But the results—in your own plant, on your own machines—tell their own story! Produced of the finest, toughest steel ever alloyed for their respective uses—Atkins "Silver Steel" Saws and Knives help you to achieve a more profitable spread between cost and selling prices!

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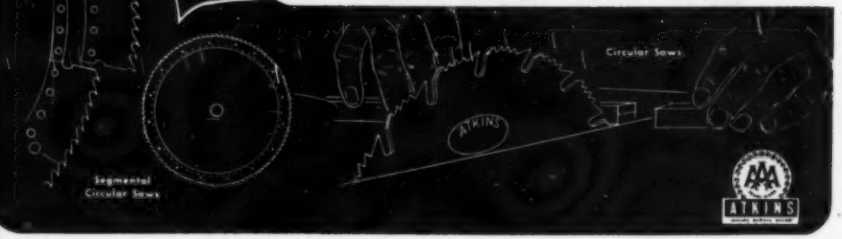
ATKINS



WOOD New Literature Section...

KNOWING YOUR TREES, by G. H. Collingwood and Warren D. Brush. Published by the American Forestry Association, distributed by the Devin-Adair Co., New York. 312 pp. $5.00.

Trees, like people are best known by their characteristics. This book identifies more than 150 outstanding American trees. The text is very well illustrated with photographs of the trees—winter and summer — and a number of drawings. Each tree is identified with drawings of its leaf, bark, flower or fruit, accompanied by a map showing where it grows best. The book is sufficiently technical without following the lines of a textbook.

The trees are grouped by families and is very well indexed. A description of the wood is included and suggestions as to best uses for each type. The book is especially helpful to those who are interested in knowing the growing tree as well as being able to identfy the lumber by grain pattern.

WOODEN TOYS

With metal, plastics and rubber on the National Production Authority's critical list and with little prospects of their being made available in quantity for other than military purposes, toy manufacturers are faced with the need of utilizing wood to a greater extent than ever before.

Realizing particularly the shortage of metal, Patent Publications, Washington 15, D.C., have closely searched the U.S. Patent Office files and now have available a list of 111 expired patents of wooden toys, the majority of which may be manufactured with no metal parts at all; others could be made of a combination of composition board or plywood, and plastics. This special Wooden Toy Patent Group-List, T-1, gives the mechanical claim of the inventor and also shows a drawing of the toy itself. Any of the patents may be utilized by American toy manufacturers as all have expired. Toy designers, by studying this group-list, can select those items of interest and purchase the patents direct from the U.S. Patent Office for 25c each and thus secure complete drawings.

The Wooden Toy Patent Group-List sells for $5, and may be ordered from Patent Publications, Box 4094—WD, Washington 15, D.C.

CHAIN MORTISE GEAR

A catalog describing the Renold chair mortise gear. The complete gear consists of a mortise chain, guide bar and sprocket. Contains tables showing the chain length in pitches, guide bar, sprocket and chain for the size of hole that is to be cut. Included also are the repair parts, tools and chain grinding machines necessary for the upkeep of these gears.

The catalog is issued by the Renold & Coventry Chain Co., Ltd., Manchester, England who is represented in the U.S. by General Chain & Belt Co., 292 Lafayette St., New York 12, N.Y.

STALTER

THERMO TEMPER

TUNGSTEN TEMPER

KNIVES

do the job better

Your machines are only as efficient as their knives. Stalter knives will improve their work and production. They stand up under high speeds and heavy feeds. Thermo-Temper knives represent the finest in carbon steel; Tungsten-Temper gives you the advantages of high-speed steel. For over 35 years we've supplied woodworkers with knives for shapers, planers, tenoners, moulders, etc. Also automatic lathe knives and band saws.

PROMPT DELIVERY

Let us recommend knives for your machines and jobs. Ask for catalog containing complete details. You are promised prompt delivery of all orders.

STALTER EDGE TOOL COMPANY

GRAND RAPIDS MICHIGAN

TECO TRUSSED RAFTERS

The Timber Engineering Company presents an illustrated booklet showing the ways in which Teco trussed rafters have and may be used profitably in commercial, industrial, church, school and residential construction. Teco trussed rafters are described with their various parts such as split-ring connectors and trip-l-grip framing anchors. Examples of special framing with the use of trussed rafters are given such as hip roofs, ell roofs and overhangs.

Write the above Company, Dept. WD, 1319 18th St., N.W., Washington 6, D.C.

PRACTICAL VENEERING, by Charles H. Hayward. Published by J. B. Lippincott Co., E. Washington Square, Philadelphia, Pa. 166 pp. $2.50.

Veneering is an indispensable branch of woodworking. The scarcity of finely figured woods makes economy in their use essential. In fact many woods are unobtainable except in veneer form and therefore, every man who makes furniture must know how to veneer.

The subject is full of pitfalls for the beginner. A piece of work may appear sound when completed and later defects may show through. This book describes methods which have been tested and proved by experience. It carries the reader step by step through every stage, illustrating the processes with clear line diagrams.

Advantages of veneering are fully discussed; cutting methods and kinds of veneer. Other chapters include: hammer veneering, caul veneering, built up patterns, veneer presses, veneering shaped work and a chapter on defects and their repairs.

GLUE SPREADERS

Gluing problems in the production of plywood and furniture panels are analyzed in a new bulletin published by the Chemical Division of the Borden Company. Under the headings of

spreading equipment, glue proportions and maintenance of equipment, the bulletin discusses the various flaws traceable to improper or uneven glue spreads. Also included are tables of recomended glue spreads, surface grooving procedures, directions for flour extension of glue and calculations to determine the amount of glue spread.

Write for Bulletin No. 85, The Borden Company, Chemical Division, 350 Madison Ave., New York, N. Y.

BLADE CIRCULAR SAW CATALOG

The Blade Manufacturing Company presents in a 14 page catalog their line of circular saws. Featured are rip saws, cut-off saws, combination saws, combination saws for portable electric hand saw machines, hollow ground combination saws and semi-high speed circular metal-cutting saws.

The saws are clearly pictured and with each one is a magnified line drawing of the type of teeth it has. Next to these illustrations is a complete, legible stock list showing diameter, gauge, number of teeth and type of teeth for each blade. Detailed information is given on teeth, gauge, set, beveling, filing center holes, side clearance, sharpening and maintenance.

Write the Blade Manufacturing Co., Dept. WD, 909 W. Third Ave., Columbus, Ohio.

DE WALT CATALOG

De Walt, Inc. has issued a tools and attachments catalog which includes their entire line. Saw blades, dado heads, cutter heads and cutters, abrasives, boring and router bits, disc sanders and others are included with complete descriptions and specifications for each item.

Write to De Walt, Inc., Dept. WD, Lancaster, Pa.

An extra hand on assembly jobs

"YANKEE" 130A Spiral with the "Q-R" spring

One hand's free to hold the work when you drive screws with a "Yankee" 130A. The quick-return (Q-R) spring in the handle keeps the bit in the screw slot, brings the handle back after each push. Speeds driving in narrow, inaccessible places. One hand operation plus fast-action spiral puts push into assembly work. Like all "Yankee" Tools, the 130A is made for years of hard work.

"YANKEE" CENTERING SLEEVE BIT SAVES TIME AND SLIPPAGE

No time lost fitting bit into screw slot. This spring-mounted bit automatically finds the slot and stays there. No slipping, burring or gouging. Two sizes, 7/32" and 9/32" at tip. Your industrial distributor sells "Yankee" Tools and accessories.

Write for the "Yankee" Tool Book

"YANKEE" TOOLS NOW PART OF

STANLEY

THE TOOL BOX OF THE WORLD

NORTH BROS. MFG. CO.
Philadelphia 33, Pa.

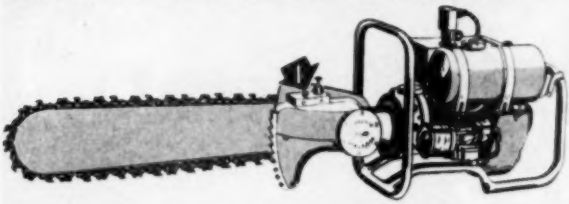
FESTO *Semi-Automatic shutter grooving machine*

for cutting grooves in louvered doors, window-shutters, gable-louvers etc. The cutterhead can be adjusted to any angle for left or right horizontal and vertical slots by means of graduated dial. One of the many advantages of this machine is the adaptability to short-lot jobs, because it requires only a few minutes to change from one set-up to another. The machine has a built-in three phase motor. The clamping of the workpiece, the infeed and the grooving is performed by a single lever movement. This and the fast cutter-speed makes this a very rapid operating machine. Other Festo-equipment includes, stationary lacquer finishing machine, single-end tenoners, chain-mortising machines, radial saws. Write for catalog and price list.

SPECIAL WOODWORKING MACHINES

745 — 51st STREET, BROOKLYN, N.Y.

from a small Lombard chain saw

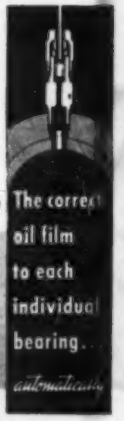


to a large CKL door sticker

Bijur lubricating systems insure correct lubrication

To keep the chain saw well-oiled, Lombard builds in a miniature "one-shot" lubricator (1). Similarly, CKL designs a Bijur fog system (2) into the door sticker to keep the spindles running smoothly at 9000 rpm. Both manufacturers have solved their lubrication problems with Bijur lubricating systems—custom-engineered for all types of wood-working machinery. Write for descriptive bulletins.

549



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LUBRICATING CORPORATION
ROCHELLE PARK, NEW JERSEY

M & M MOLDER PLANER

MOLDER and M M PLANER

FOR COST CUTTING MOLDING & PLANING *on the job!*

- Utilizes waste lumber
- Takes stock up to 4 x 11"
- Eliminates gouges, chatter marks, etc.
- One year guarantee against defective workmanship or material

SAFE . . . Cutters are recessed in head and protected on either side by pressure bars.

VERSATILE . . . Models can be changed from molding to planing in less than five minutes.

RUGGED . . . Finest materials available are used, including solid cast head, table, pressure bars and steel pulley.

PAYS FOR ITSELF . . . Converts waste stock into molding.

BENCH MODEL $67.50

FLOOR MODEL $94.50

Complete for Thickness Planing

FEATURES

1 Adjustable pressure bars hold work flat for precision planing.

2 Chips and sawdust ejected away from material and machine through head.

3 Four-knife cutter head.

4 Precision made arbors guarantee accurate setting of cutters.

5 Sealed-for-life ball bearings.

6 High grade tool steel cutters for heavy duty work.

WRITE FOR COMPLETE INFORMATION

EAGLE SALES CO. KEENE, N. H.

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THE SMITH No. 505 THREE DRUM ENDLESS BED SANDER

FOR THE FINEST AND THE GREATEST PRODUCTION

H. B. SMITH MACHINE CO.

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RESOURCEFULNESS

MOST IMPORTANT among the ingredients which comprise any Reliance finish are the experience, imagination and resourcefulness of the men who create it. These ingredients carry no premium — rare and priceless as they are.

At Reliance — not only have our research chemists the sound background of experience and the elasticity of thinking to cope with new problems, but the most modern laboratory and manufacturing facilities as well — where development, control and testing combine to create and deliver superior finishes.

Reliance customers, of course, know these things and have seen them operate to their advantage and profit. We are anxious for an opportunity to help you too!

For additional information address 4732 Crittenden Dr., Louisville, Ky.

WWD Finishing Section

SUCCESS in the *Finishing Room*

By C. A. Denney

Industrial Finishes Technician
The Sherwin-Williams Company

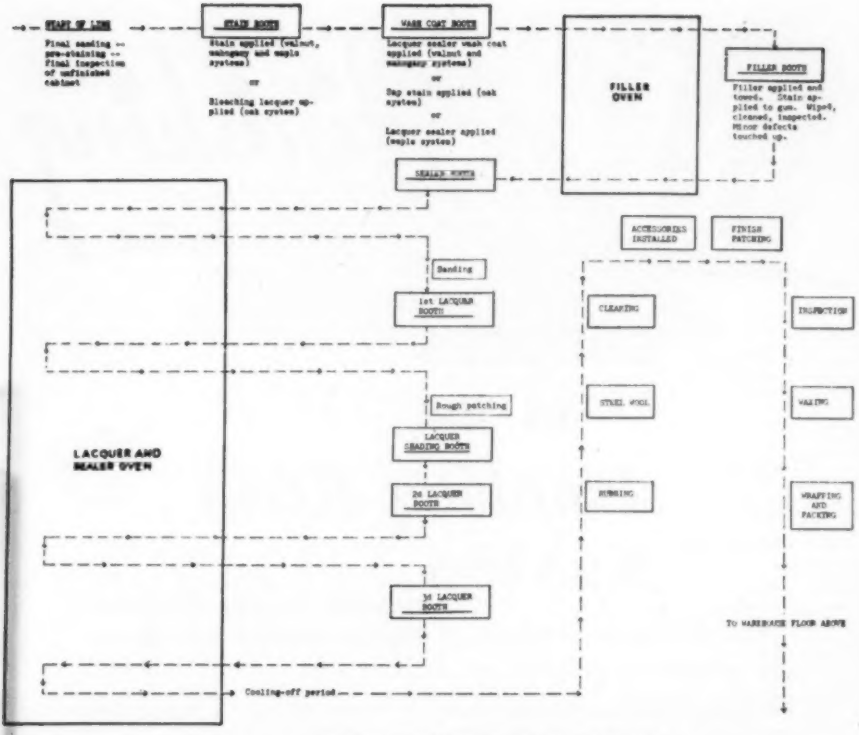
IN THE wood finishing field, production problems are likely to be more complex than in many other industries.

Unlike many highly mechanized operations involving metal products, wood finishing relies strongly on craftsmanship—the irreplacable human skills. In this the industry takes pride, for in the final analysis individual skill accounts for quality that cannot be achieved otherwise. This very fact, however, can complicate a problem production-wise. As a case in point, consider the experience of Free Sewing Machine Company:

An acknowledged leader in its field, Free Sewing Machine last fall was establishing record figures in unit sales. Its large Rockford, Ill., plant was pressed to capacity to keep abreast of consumer demands. In attempting to increase output, a major production line kink developed in the company's cabinet finishing department. The existing "push - pull" finishing methods, which depended on air-drying, required a great deal of floor space. Steps to accelerate finishing room production made it apparent that floor space was inadequate for efficient handling without sacrificing quality. Acute traffic problems resulted.

It became clear to management that the finishing department had reached its maximum schedule under the prevailing finishing system. The diagnosis, in short, was a critical case of finishing room congestion.

Characteristically, Free Sewing Machine Company set about not only to unsnarl a production bottleneck but at the same time to upgrade the quality



Flow chart - cabinet finishing operations - Free Sewing Machine Co.

Flow chart of the cabinet finishing operations at the Free Sewing Machine Company. Start of line begins with final sanding, pre-staining and last inspection of unfinished cabinets.

of cabinet finishes and to establish a system at once flexible and adequate, whatever the requirements in the future. In effect a "task force" was created to accomplish these objectives:

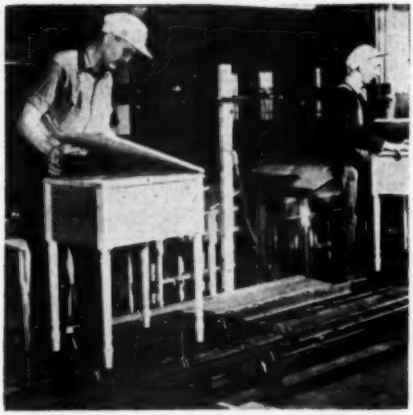
1. To step up production by eliminating finishing and drying bottlenecks.
2. To improve the level of quality of the finished product.
3. To reduce the number of rejects by more accurate regulation and control of every operation.
4. To effect savings in production costs compared to the slower, less efficient operation.

On the "task force" team were representatives of Free Sewing Machine Company, The Sherwin-Williams Co., which developed the finishing procedures and plant equipment engineers. This cooperative approach to the problem resulted in a solution which has achieved all of the desired objectives. The key to the solution was the joint development of a procedure incorporating the best features of modern mechanical plant equipment, the installation of forced drying ovens and the establishment of finishing systems which utilized materials suitable for the company's type of operation.

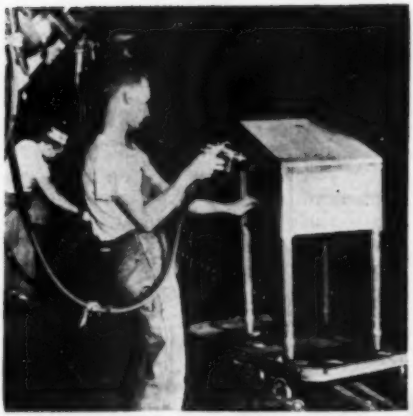
Evidence of the success of Free Sewing Machine's new finishing system is found in results obtained during the first six weeks of operation: Today finished cabinets are rolling from the production line at a rate of one a minute, yet there is additional production capacity in reserve. The number of rejects has been reduced by more than 90 per cent, compared to the outmoded "push-pull' method. Quality of cabinet finishes has been improved and a quality control program established.

Here's how Free Sewing Machine Company accomplished these objectives: A floor-type conveyor, the track slightly elevated for comfortable working height, was installed. Its over-all length is approximately one mile. The conveyor extends from the room in which unfinished cabinets are placed aboard to the warehouse, where the packed cabinets are removed for storage and shipment.

Stations on this conveyor line include nine spray booths and two large ovens. Each spray booth is large enough to accommodate up to three operators with complete spray equipment as needed, providing wide flexibility in productive capacity. The temperature and humidity in the ovens are automatically controlled. Recording instruments on the outside of the ovens register the prevailing heat and humidity factors. At the start of each day's operations the previous day's charts are removed, dated and filed, then fresh charts are installed in these instruments.



Good finishing starts here with final inspection. This is at the beginning of the mile long conveyor line. Assembled cabinet is placed in line, dusted off with air hose and given final careful inspection before being allowed to leave the assembly room.



First production line operation is to apply mahogany, walnut or maple stain. The operation is divided between two operators. Cabinets air-dry as they move on to wash-coat booth.

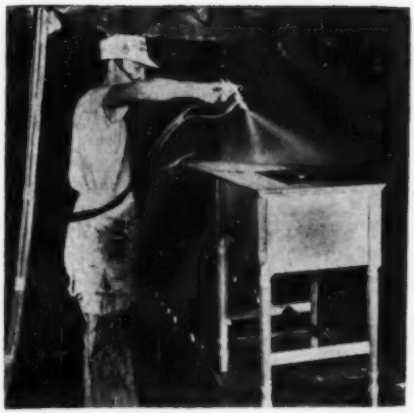
As cabinets move through the finishing system they rest on pallets, of which there are a total of 1,500. The cabinet enters the spray booth in a lengthwise position. The pallet can be turned completely around in the spray booth, facilitating the coating of each unit. As cabinets leave spray booths they are turned automatically crosswise to the conveyor and travel in close formation through the ovens. The pack formation continues until the cabinets again are turned automatically

for finishing work between coats or passage through the next spray booth. The conveyor can be operated at various speeds and turn out up to 1,500 units per eight-hour shift, depending on production requirements.

Stepped-up production, however, is made possible without sacrificing the important element of craftsmanship. While the mechanized production line was in the blueprint phase, Sherwin-Williams technicians were studying drying times, temperatures, humidity conditions and over-all schedules. Every single finishing material was tested on complete cabinets before it was accepted as meeting the required standards. When it is considered that there are 24 major finishing items in use on the conveyor line, it is readily understood why thorough analysis was necessary to assure trouble-free performance.

Since Free Sewing Machine uses four complete finishes on four different kinds of wood—walnut, mahogany, oak and maple—it was necessary to design the finishing systems so that each could be integrated into the conveyor line. At the same time, sufficient flexibility was desired so that future improvements in systems or materials could be easily incorporated. As a result, the installation is so devised and forced drying times so arranged that they can be adapted to use any finishing system, including the synthetic heat converting type of materials.

Wash coat is applied here on walnut and mahogany cabinets. Pallets turn automatically as they leave booth and travel in close-pack formation for flash-off period before entering oven for force-drying.



After wash coat has been force dried, cooled and sanded, filler is applied at this station to all veneer parts, then towed off while semi-wet.

The start of Free Sewing Machine's high quality finish is in the cabinet room itself, after all parts are properly milled, glue-sized, sanded and assembled. Proper preparation of the wood is a pre-requisite to conveyor line finishing.

Once the units have been placed on the line, they must travel through the entire system. Start a properly prepared unit on this conveyor and it will emerge nine hours later a quality product, consistently uniform in finish and ready for shipment.

After cabinets are completely assembled, with lids, bibs and doors hung, cleaned and sanded, they are given a final cabinet assembly inspection. At this point a pre-sap staining

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operation on walnut cabinets is done by hand on the edges of all doors and a pre-trim staining operation also is done by hand on the edges of doors and overlays of mahogany cabinets.

These are the finishing systems for the various Free Sewing Machine cabinets:

Walnut and Mahogany Finishing Systems

As the cabinets enter the stain booth, Sherwin-Williams sap stain is applied on walnut cabinets by spray to all sap streaks in the veneer and to all gum parts, which include legs, stretchers and shaped edges of top and lid. With mahogany, trim stain is used in the same manner.

The cabinet travels to the next operator who applies Artistain by spray over the entire cabinet, inside and out. Hinges then are wiped clean of stain.

In close formation, the cabinets then are air-dried as they move to the wash coat booth. Here they receive a lacquer sealer wash coat applied by spray and proceed, in pack formation again, for their flash-off period and enter the oven for force drying. On emerging they cool for a required time and then are sanded.

Filler is towed off cabinet body by hand, and off the top and inside and outside of lid with this mechanical towing machine. Cabinet is then wiped clean.

After being inspected for proper filling, wiping and cleaning, cabinets travel into and through filler oven for correct length of time required for drying. Cabinets are seen leaving filler oven.

Next the cabinets pass into the filler booth where semi-paste filler, reduced with VM&P naphtha to spraying consistency, is applied by spray to all veneer parts. Gum stain, also reduced by VM&P naphtha, is sprayed on gum legs and stretchers.

When cabinets leave the filler booth, legs and stretchers are wiped clean. The filler on the top, the inside and outside of the lid is towed off by means of a mechanical towing machine while the filler still is semi-wet. The cabinet body is towed off by hand, and the final hand towing of the top and lid is completed. The cabinet is then wiped clean. Excess filler around hinges is blown off with a small air gun.

Oak Finishing System

When oak cabinets reach the stain booth, clear bleaching lacquer is applied by spray, inside and out. These then follow the same procedure as walnut and mahogany cabinets except that at the wash coat booth, oak sap

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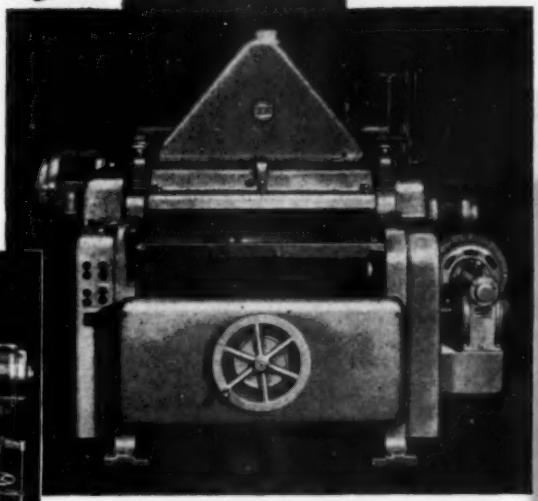

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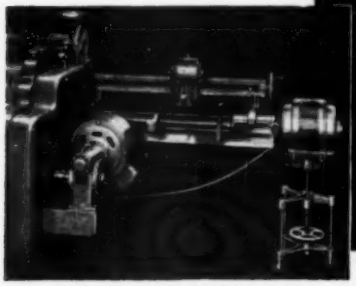

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stain is applied where needed. Subsequent steps are identical.

Maple Finishing System

When maple cabinets reach the stain booth a coat of Sherwin-Williams honey tone maple Artistain is applied by spray, inside and out. At the wash coat booth a coat of Opex lacquer is applied by spray, inside and out.

Maple cabinets follow the walnut and mahogany procedure except that they receive a thorough sanding at the sanding station, again inside and out. Due to the fact that the maple cabinets already have received the sealer coat (Opex lacquer) they do not require further sealing at the regular sealer station.

When these cabinets enter the filler booth a coat of speed glaze, reduced with VM&P naphtha, is applied by spray, then wiped clean. From this point on, the finishing procedure is the same except that maple does not require further sealing.

Final Finishing System for All Cabinets

All cabinets travel to the inspection station for examination to see that they are properly filled, wiped and cleaned. If minor defects are found, they are marked and, a few feet farther on, an operator repairs and touches up the indicated points.

Provision has been made at this point for an additional spray booth in which Sherwin-Williams Homoclad sealer may be applied, if desired, at a later date. Thus the Homoclad system could be adopted without any further mechanical installations. In this way additional advantages of the next step have been anticipated in a forward-looking plan for producing progressively higher quality finishes.

After the minor defects are remedied, the cabinets travel in pack formation into the filler oven where uniform

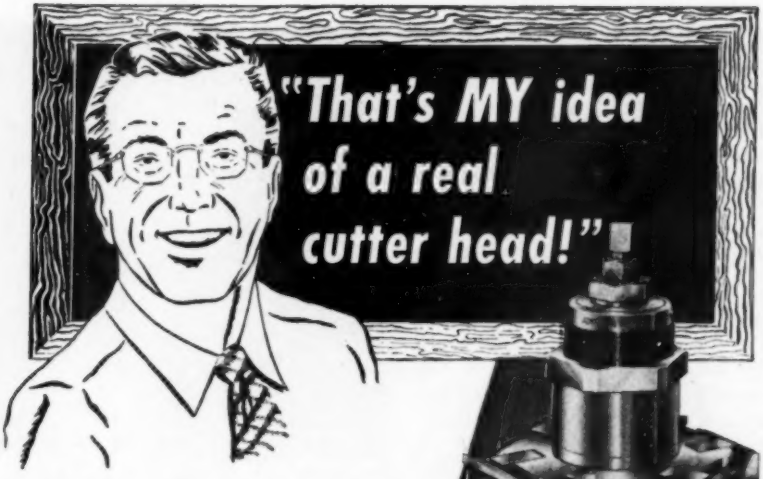
As cabinets leave sealer oven they are allowed to cool, then sanded inside and out.

temperature and humidity are maintained. Here they remain for the required drying time, then continue—while cooling—to the sealer booth.

Opex lacquer sealer is applied by spray in the sealer booth. Again in close formation, the cabinets move along the line for a flash-off period and enter the lacquer and sealer oven for drying, also under controlled temperature and humidity conditions. They cool as they move forward and are sanded inside and out.

The next station is lacquer booth No. 1, where the cabinet is sprayed on the outside with Opex B.R.E. cabinet lacquer. There is a flashing off period before they enter the oven for force drying of the first coat of lacquer. They cool enroute to the rough patching station, where minor defects are touched up and burned in, if necessary.

The next stop on the conveyor line is the lacquer shading booth, where shading lacquer is applied by spray on the gum portions that need to be made uniform. At this point workmen can



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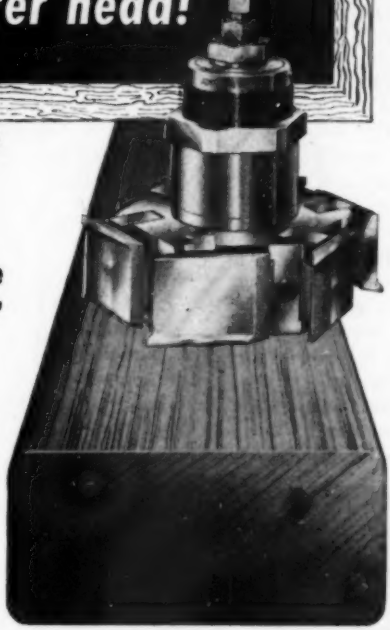

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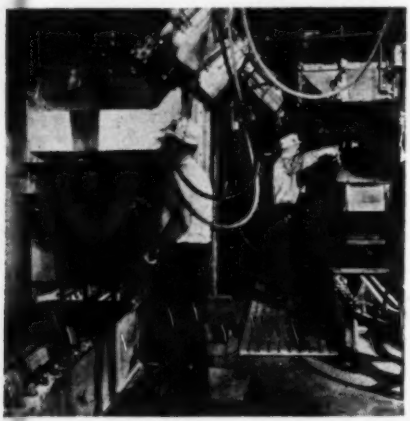
see where shading is needed and where it is not required, thus conserving time and promoting efficiency.

Lacquer booth No. 2 is the next station. Here lacquer is sprayed on the inside of the cabinet, and a second coat is sprayed on legs and stretchers, on the top and on the inside and outside of lid.

There follows a flash-off journey to the oven for force drying. The cabinets then move to lacquer booth No. 3. Here the second coat is sprayed on the inside of the door and rail of the cabinet and the outside body. This is the final spraying on these portions of the cabinet, but experience shows it practical to spray a final coat of lacquer on the top and on both sides of the lid, which receives constant wear.

It will be noted that the lacquer booth operations have been so divided that there is an equal distribution of work for each operator so that the production line tempo may be maintained.

Upon leaving lacquer booth No. 3 the cabinets flash-off, then enter an oven for final force drying of lacquer coats. After this they move along in close formation for final cooling before entering the rubbing area.



Two of three lacquer booths where finish coats are applied. Cabinets pass through lacquer and sealer oven after each finish coat is applied.

Rubbing is done both on and off line, with operators each wet sanding a portion. Surfaces are then wiped clean and dry steel-wooled.

Cabinets are turned lengthwise automatically on entering the rubbing phase. Rubbing is done both on and off the line progressivly. All tops and lids are wet sanded, inside and out, using naphtha and oil as a lubricant, with each operator wet sanding a portion. They then are wiped clean and wet sanded surfaces are dry steel-wooled (fine grade wool) progressively. In the subsequent operation the body and legs are steel-wooled and waxed with a semi-paste wax, then wiped clean. There follows an inspection for proper wet sanding, dry steel-wooling and steel-wooling and waxing.

Next is the trimming area, where all accessories are installed. This work completed, cabinets pass to the final patching phase and forward to the final inspection station.

After final inspection, all wet sanded and dry steel-wooled surfaces receive

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a coat of wax and are wiped clean. This places a protective coat over the surfaces before the cabinets are labeled and prepared for packing.

The finished and inspected cabinets now are placed in cartons, sealed and stamped and carried on the conveyor line to the warehouse for storage and shipping. This completes the cycle—from cabinets in original wood to the gleaming finished product.

Free Sewing Machine Company executives report a marked reduction in the percentage of rejections on the new production line, compared to the former system.

"The new system," said E. L. LeVee, general sales manager, "has reduced our rejection problem virtually to the vanishing point and, at the same time, released personnel which was employed in moving cabinets for other more productive duties. Furthermore, it permits operators to work at maximum efficiency. The system inspires a feeling of pride in our workmen which is in turn reflected in superior craftsmanship."

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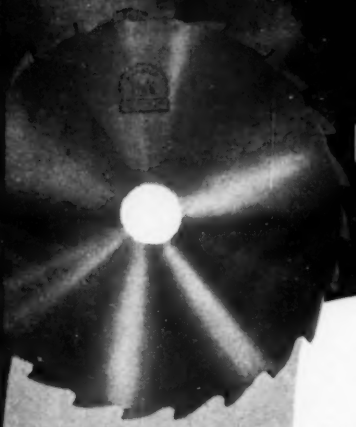

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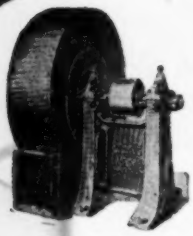

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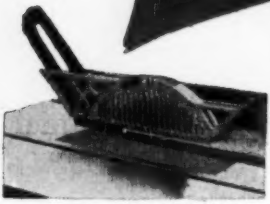
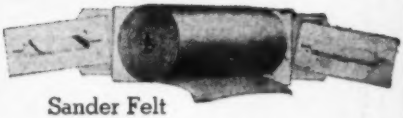
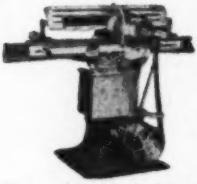


Saw Guards



Sander Felt



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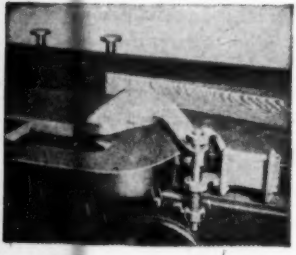
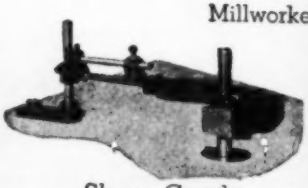


Millworker



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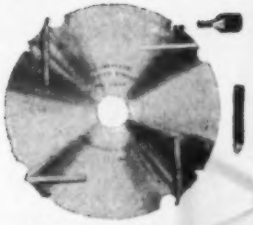
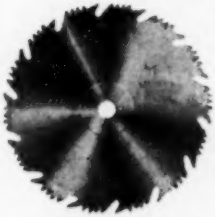
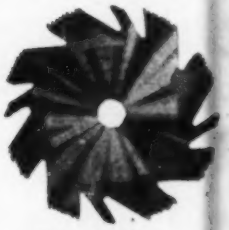


Inserted Groovers

Band Saws



Planer Saws



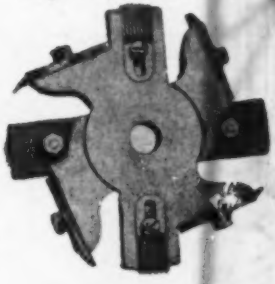
Patent Groovers

Rabbeting Saws

Common Groovers

Mattison Dado Heads

Expansion Dado Head



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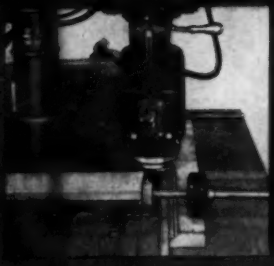

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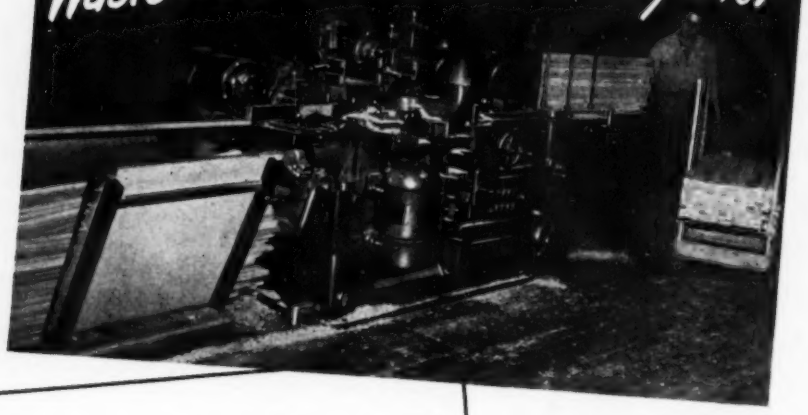

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GARDNER, MASS.

August 25, 1950

Ekstrom, Carlson & Co.,
Rockford,
Illinois.

Gentlemen:

We have now had the use of our #464 Hi-Speed Moulder for approximately five months and during that time many interesting as well as profitable features have been observed.

Our biggest problem used to be the machining of stock that contained spots of curly grain where we would lose at least fifteen percent of the pieces as they came out of the old machine. The bad pieces were re-worked into shorter, narrower and thinner pieces at a great expense. This gave us an accumulation of short cuttings over and above the amount required.

Since the #464 Moulder was put into operation, we have been able to plan our cuttings, regardless of dimensions, right from the cut-off saws and the accumulation of so-called "waste" from the moulder has been reduced to approximately three percent. This gain alone will pay for our moulder in a very short time.

When running small lots such as we do, set-up time is great and adds to the cost of production. Our operator has found that our #464 moulder is set-up in less time and needs only a little attention after the set-up of machine has been completed.

We write this letter so you will know that we appreciate such savings and also thank you for the excellent service received in setting us up to do the jobs we want the machine to do.

Trusting you will continue to produce great machines for the woodworking industry, and thanking you for your many courtesies, we are,

Very truly yours,

CHILDREN'S FURNITURE CORP.

Howard O. Stickman

Howard O. Stickman, President

HOS/plt

EKSTROM, CARLSON
No. 464 HI-SPEED MOULDER

The machine, shown above, with which this substantial saving of material was achieved is a standard 6" No. 464 ECCo Hi-Speed Moulder with hopper feed . . . You are invited to write for a list of users of ECCo Moulders nearest your location . . . ECCo Moulders are made in 4 sizes.

No other moulder, regardless of price, gives you ALL the advantages of the ECCo Hi-Speed Moulder. With Ekstrom, Carlson Moulders you can:

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What makes the SPRAY GUN SPRAY?

Part II

... BY PAUL H. GRAHAM

THE INTERNAL MIX air cap is only used with pressure feed spray guns and mixes air and material inside the cap and ejects the spray through either a round or slotted opening. Narrow slotted caps are generally used for spraying light materials and wide slotted caps for heavy materials. The chief objection to the use of the internal mix air cap is encountered when fast-drying materials are sprayed. Then there is a tendency for the material becoming dried inside the orifice of the cap when the material is atomized inside the cap, and frequent cleanings are required.

Selecting the Proper Air Cap

Aside from their feed and mixing action, air caps are selected on the basis of: the volume of air in cubic feed per minute and pressure in lbs. per square inch available for spraying; the kind of finishing material and volume to be sprayed; and the size and nature of the work surface to be sprayed. Since most air caps work best with certain nozzle sizes, an added consideration would be the nozzle size of the fluid tip to be used.

It is always well to remember in selecting an air cap for any spraying job that larger or an increased number of orifices in the air cap will increase its ability to atomize viscous or high solids materials, but the amount of air required will also be increased. Less air volume is required when the air cap has smaller and fewer orifices, but the ability to atomize and the speed of spraying will be cut down likewise.

A proportional increased volume of air must always be available to atomize the fluid material as its specific gravity or viscosity rises. Also, as the flow of fluid material increases through the fluid tip, the greater must be the velocity of air to maintain the proper air-fluid balance. The perfect spray can only be obtained by maintaining a perfect balance of air to fluid, since a given flow of fluid requires a given flow of air to atomize it.

It can readily be seen that heavy-bodied and viscous materials require air caps of a type which will provide the most air to atomize the material. This selection, however, cannot be made solely upon the number of holes the air cap carries. All air caps are designed for specific jobs when precisely matched with proper fluid tips. One make of multiple jet air cap may contain nine holes in a certain arrangement. Another air cap might also contain nine holes arranged in an entirely different way and even the inside of the cap may be of different design. Each air cap is designed for a special job and has its own individual characteristics placed there by the manufacturer for a specific purpose. This is the reason why the manufacturer's recommendations for different requirements are so important.

In their general application where small work is to be sprayed, it is well

to select an air cap that will produce spray patterns of limited size. This affords considerable economy in material used and makes for more efficient spraying. Large surfaces, on the other hand, can be sprayed more economically and efficiently with a large fan-shaped spray that allows the operator to cover a wider area with a single stroke of the gun.

Air caps are always made of non-ferrous metals, such as brass, copper and aluminum. This is to eliminate the fire hazard from sparks that might be produced by dropping or striking the cap on something hard enough to produce a spark. These metals are relatively soft and easily damaged, and a damaged cap usually means a poor spray job.

At the center hole of the air cap around the fluid tip, there is a raised portion or platform whose relation to the end of the fluid tip is most important. Its condition can reverse the designed action of the air cap from suction or syphon to a full back pressure if it becomes marred by striking it against something hard, or if finishing material is permitted to build up on its surface. If the air cap is badly indented or scratched, it should be replaced; if material accumulations have built up upon its surface, they should be cleaned off.

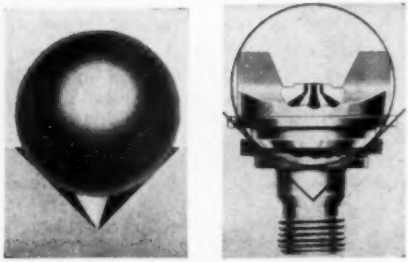
The manner in which material builds up inside the internal mix air cap can be readily understood. The case of the external mix air cap is a bit more involved. High pressure air, in the form of compressed air, is ejected from the holes of the air cap at a high velocity while the operator is spraying. Although these jets of compressed air are directed to a definite point to deliver the spray to the surface of the work, the air expands rapidly in its travel from the orifice to the point of work and these compressed air jets give rise to other currents of air to create a turbulence. If these jets of air are deflected by burrs or nicks in the orifice, particles of material are caused to fly back and build up upon the surface of the air cap.

Many operators keep two caps of the same type on hand for the spray gun so that frequent changes can be made. The air cap that is removed is placed in a small container of solvent, raised from contact with the bottom by a submerged screen. After soaking in the solvent, a slight scrubbing with a brush is usually sufficient to remove all material accumulations. Stubborn accumulations may be removed with small soft-

Methods used to remove material accumulations from air cap after soaking in solvent. Left: correct to remove by slight scrubbing with a brush. Right: wrong to use nails or other hard metal instruments to clean as they may mar the air cap holes and distort the spray.

wood splinters, toothpicks or matches. Wire or hard metal instruments should never be used as they can easily mar the air cap holes and distort the spray. The caps should always be dried and cleaned with a final air duster blast before using.

The holes of the air cap should always be in perfect shape and condition as even slight burrs, invisible to the eye, can result in poor spraying. Burrs of this kind can usually be detected by moving the finger nail at various angles around each hole, applying light pressure to the finger nail as it is moved over the hole surface.



Left: illustration of ball and cone principle or relationship of fluid tip to air cap. Right: actual application in which concavity of fluid tip acts as self-aligning concentric seat for convex surface of air cap.

Importance of Fluid Tip

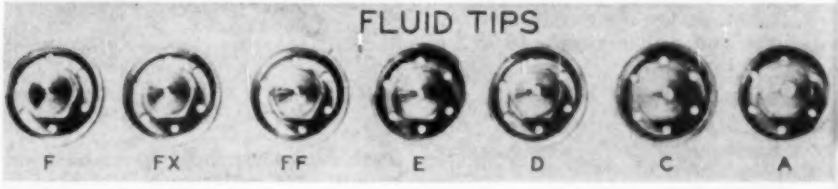
The fluid tip is fully as important as the air cap. Its prime function is to meter and direct the fluid material into the air streams for atomization. In some makes of spray guns it operates on the ball and cone principle, with the precision machined concavity of the fluid tip acting as a self-aligning, concentric seat for the convex surface of the air cap.

Fluid tips are furnished in different nozzles or diameters of openings in the tip. The nozzle size of the tip determines the volume of fluid material that can be metered into the atomizing air streams. A fluid needle is provided to vary the amount below this maximum as well as to start and stop the flow of the material. In its normal position the fluid needle is seated firmly against the inside of the fluid tip nozzle to cut off the fluid material passing through.

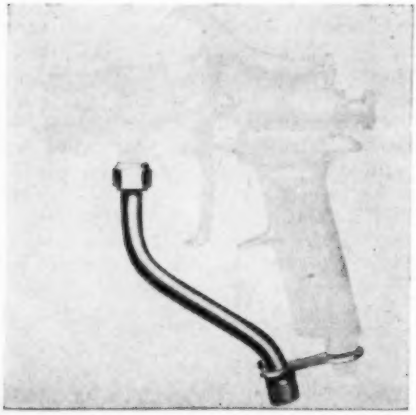
The flow of material through the nozzle is governed by trigger pull and fluid needle adjustment. The fluid needle is drawn from its seat as the spray gun trigger is pulled back and the fluid needle adjustment limits the backward movement of the needle to control the opening between the needle and needle seat of the fluid tip, thereby limiting the volume of material flowing through the nozzle. In some makes the needle stroke can be locked to prevent waste of material.

Various factors, such as kind and viscosity of materials to be sprayed or type of material feed used, govern the proper selection of fluid tips, but care should always be taken that the fluid tip selected is not too large. The belief that spray production is dependent upon the size of the hole releasing the material, is all wrong. Speed in spraying is primarily dependent in production operations upon the material feed tank pressure. It is possible to have more material flow out of a small hole at 20 lbs. pressure than will flow from a larger hole at 5 lbs. pressure. Other factors being equal, the smaller nozzle will give better spraying results than the larger one.

The reason for this is that while a small volume of air can envelope a small stream of fluid material and keep it under control, the same amount of air can hardly be expected to contain and control a large stream of material. In other words a smaller volume of fluid requires less volume of air for atomization and the size and design of the nozzle should be such that the



Fluid tips or nozzles.



Fluid inlet extension used to bring air and fluid hose connections together at handle of spray gun.

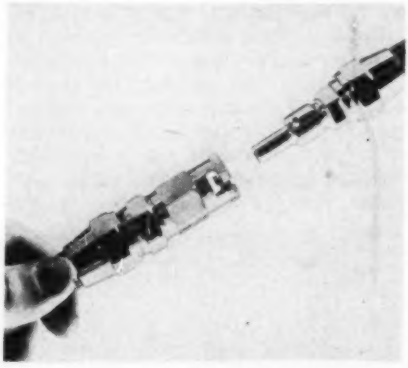
stream of finishing material passing through it is entirely surrounded by the directed compressed air to confine the spray to the closest possible limits to form a good spray pattern and to eliminate waste.

Tests have shown that the smaller nozzles will deliver up to 1 quart of fluid material in 2 minutes and 20 seconds and medium sized nozzles will deliver a quart of material in 32 seconds at low material feed pressures indicating a wide range of delivery. Standard nozzle sizes range from 0.028 to 3/16-in. in diameter. These sizes are indicated commercially in various ways, as for instance, some are designated by the letters: A - C - D - E - FF - FX - G, others by numbers: 33 - 33B - 33D - 35 - 36 - 38 - 41 - 42 or 63A - 63B - 63C - 65 - 66 - 67 - 68 - 69 - 69A - 69B, and others are designated by c.f.m. capacities and orifice sizes - 00 - 0 - 2 - 4 - 6 or 8.

Where the lettering system is used, the sizes E and EF are most generally used in standard production spraying operations with diameters from 0.042-in. to 0.07-in. General recommendations give an idea of the range of fluid tip sizes used to spray various types of finishing materials, as follows:

1. Heavy, coarse or fibrous materials require large nozzle sizes, to permit passage of the material and prevent clogging.
   Example: Plastic paints—CS nozzle —size 4—6 or 8—pressure feed only.
2. Viscous materials requiring high atomizing pressures are handled better through the small nozzle sizes which assure more complete atomization.
   Example: Synthetic enamels—E or CF nozzle—for high atomization —suction feed, or F or FX nozzle or CTF nozzles—for high atomization pressure feed.
3. Very thin materials that sag readily are applied at low atomizing pressures with small nozzle sizes to prevent excessive material applications.
   Example: Stains—FF or CFO— 6 c.f.m. nozzle — suction feed, or F or CTO—9 c.f.m. nozzle—pressure feed.

. It will be noted that when pressure feed is used, the nozzle is relatively small, but when suction feed is used the nozzle is usually slightly larger. This is subject to common sense application, of course. For instance, where



Quick change detachable connections with bayonet joint easily made or broken by slight turn of the wrist.

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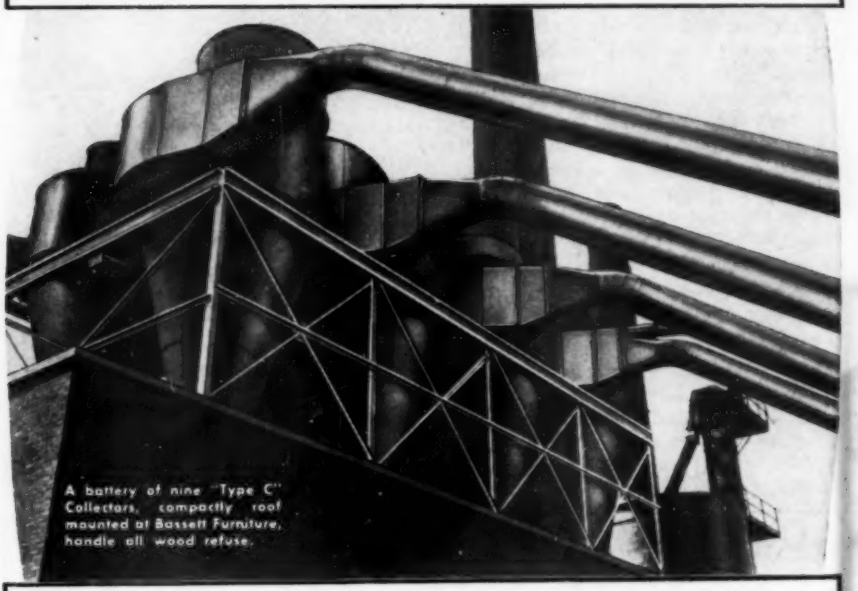

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a finishing material contains an appreciable amount of pigment, it is desirable to use a nozzle large enough to pass the desired amount at low pressure.

High pressure is seldom used at the pressure-feed material container with material of this kind because more compressed air would be required to atomize the material. Excessive air pressure has a tendency to drive too high a percentage of solvents out of the spray pattern and to force the heavy particles of the pigment out of suspension. With this kind of material, or other materials which require low atomizing pressures, internal mix air caps may be used.

Fluid tips are generally made of a wide range of materials—aluminum, brass, cold-rolled tool steel, nitralloy, stainless steel, and even cemented carbide inserts are used. Shapes range from a flat face with sharp corners around the outer edge, flat face with the sharp outer edge removed, to an almost fully rounded face. Some are made with a tapered fluid orifice, while others have a straight-walled orifice.

The different metals are used as suited to the various materials to be sprayed, that is, to cope with the natural abrasive or corrosive action. One spray equipment manufacturer uses the following metals: hardened steel for ordinary materials not abrasive or corrosive; nitralloy for materials abrasive but not corrosive; stainless steel for corrosive materials, and special alloy inserts for extremely abrasive materials.

As a guide to proper selection, noncorrosive fluid tips are required when wood bleaches or metal cleaners are sprayed, and porcelain enamels require a fluid tip that will withstand

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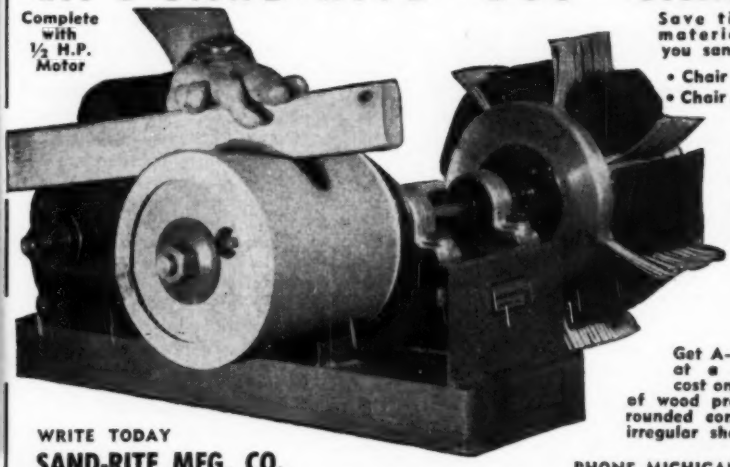

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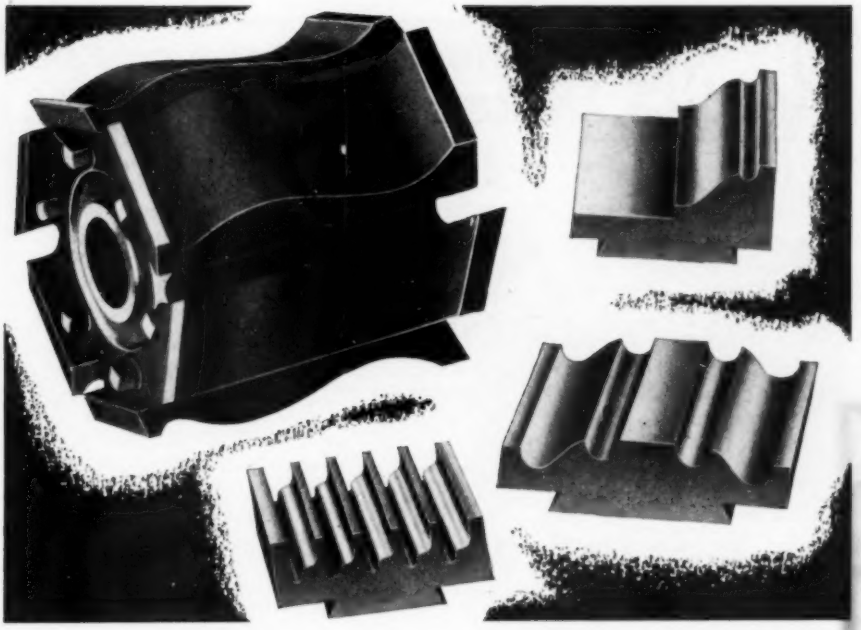

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the abrasive action of the fluid. Fluid tip nozzle sizes are usually selected on the basis of 0.04-in. to 0.06-in. being used for spraying light materials which require extra fine atomization; 0.07-in. to 0.085-in. for average viscosity materials and high speed applications; and from 0.09-in. to 3/16-in. for spraying heavy-bodied materials and rough work.

Both the fluid needle and fluid tip are subject to wear due to the constant friction of the needle against the tip. It is important to keep them as clean as possible for material accumulations on either the fluid needle or fluid tip will cause the parts to wear away more quickly.

The seating of the fluid needle is also of prime importance. The fluid needle packing nut should never be so tight as to require extra tension on the fluid needle springs. If the nut is too tight, it is likely to retard the needle to permit material to leak from the tip. If it is too loose, the material may leak back through the packing. The packing nut should be tightened just enough to prevent leakage but not tightly enough to grip the fluid needle.

The packing is usually of felt, preformed asbestos, or leather lubricated with an impregnation of graphite. Many operators form the habit of backing off the packing nut every night, and applying a few drops of light oil to the packing so that it will soak in during the night. This usually smooths action the next day. Some makes feature self adjusting compression packing.

The most common causes of fluid needle trouble are a worn or bent needle, or dried material accumulations on the needle which result in poor and improper seating of the needle. The fluid needle spring, fluid needle and fluid tip are the parts of the spray gun

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that usually wear out first. The spring is both sensitive and delicate and is constantly in use. There is little that can be done to prevent it from wearing out rapidly but it is relatively inexpensive and should be replaced at first signs of wear. Fluid needles and fluid tips should also be replaced at first signs of wear or damage if best results are to be expected. They should be completely free from burrs, heavy scratches or tool marks.

Cleaning the Spray Gun

While on the subject of equipment condition, it might be well to issue a timely warning. Never soak the completely assembled spray gun in solvent to clean it. This is bound to remove the lubricant and leave the packings dry. The gun should always be cleaned immediately after using by spraying through a thinner or solvent suited to the material previously sprayed until it runs clear.

For a thorough cleaning the spray head should be removed from the gun body and washed in a suitable solvent. When clean, the spray head should be rinsed in clean solvent, wiped clean, dried with an air blast, and reassembled, after which the gun should be oiled. External parts of the gun body can be cleaned with a brush or solvent-dampened cloth. All guns should be disassembled at least once every three months, cleaned thoroughly and inspected. Fresh vasoline should be placed in the fluid needle spring housing and all worn parts replaced. Other lubrication should be replaced and the gun reassembled, oiled and tested. The other parts requiring lubrication are fluid needle packing, air valve stem and trigger bearing screw.

This article began in our May issue and will be concluded next month.

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FORD Motor Company

Uses Laminated Wood in Automobile Construction

By C. F. Ferris

This is a story of progress which will have far-reaching influences in other fields. It shows an important use for laminated wood in the automotive industry. The Ford Motor Company did some pioneering and developed a better Ford product — the Ford-Mercury station wagon. — Editor.

ELECTRONIC equipment for dielectric heating is used in glue curing because it gives high speed. This is possible because the heat that cures the glue is generated in the wood and glue line assembly itself, and does not have to penetrate from the outside surfaces to the interior.

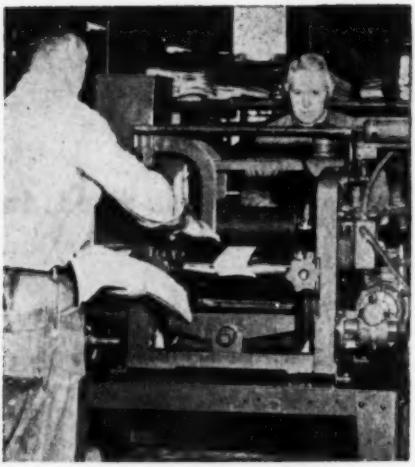
The wood assemblies, made at the Iron Mountain, Mich. plant, are glued by placing between electrodes under hydraulic pressure. These electrodes are connected to high frequency oscillators which furnish the power that appears as heat in the curing process. With sufficient power available high temperatures can be reached in a short time, permitting the use of glues requiring such heat, and at the same time getting the necessary speed.

The wood assemblies made at the Iron Mountain plant require the strongest and most durable glues that can be used. Such glues are of the phenolic type and require high temperatures to cure them. By the use of acid catalysts, phenolic glues of the right kind can be cured many times faster than without them, and by the use of the right kind of acid catalyst color development in the cured glue can be retarded.

Thus the use of electronic equipment in combination with the proper acid catalysts makes possible the use of the most desirable type of glue for these operations.

When the use of electronic equipment for gluing was being considered for the Iron Mountain Plant, visits were made to other plants using this system in order to study their methods. It was found that, due to the types of assemblies to be made and the kind of glue to be used; methods in use at the other plants would not apply to our operations, and that special methods would have to be developed for our own special problems.

One of these problems was the simultaneous making of two or more frames, each containing three to ten joints and each joint containing two glue lines approximately perpendicular to each other. Another was the making of "pillar" blanks with curved or compound curved surfaces, and having maple or birch faces, from several ply of veneer stock. The faces of these blanks were to be without glue lines and were to require no shaping to make them suitable for the flowing curves of the new station wagon bodies.



Veneer strips which have been cut to size being passed through Black Brothers glue spreader.

A 4-Kilowatt Thermex unit was used in working out these problems and satisfactory methods, jigs and molds were developed so that gluing with electronic equipment could be put into production for the 1948 station wagon.

General Data

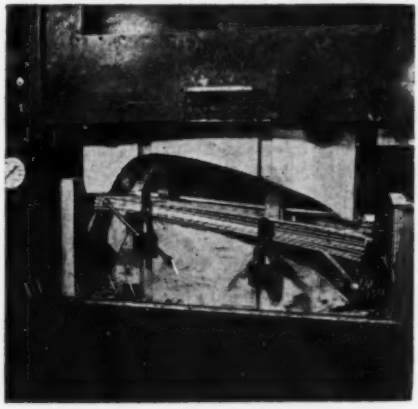
Temperatures of about 275°F. are used in curing the glue and the heating periods last from about 3½ to 5 minutes, depending on the operation. These temperatures and heating periods require about 105 B.T.U.s per pound of wood between the electrodes for the larger jobs such as blanks for "pillars," and about double this amount for the small joints used in the doors, quarter panels and windows.

The oscillator units deliver alternating currents of a frequency of about 13.6 million cycles per second to the electrodes. Voltages across the electrodes run about 2000 volts per inch more or less, depending on the type of work being done.

Glue line or selective heating is not used. Mass heating, where all the material between the electrodes is heated is the method followed, because it has proved the most practical considering the temperatures involved, the type of glue used and the kinds of assemblies to be made. The residual heat in the glued assemblies continues curing the glue after they are removed from the presses, and the acid catalyst in the glue also continues to cure the glue to full strength even after the assemblies are cold.

Pressures used in assembling the parts run about 350 pounds per square inch.

All the assemblies except finger-joints are glued together in hardwood jigs or molds, consisting of top and bottom halves. The "hot" leads are connected to the electrodes in the top halves, and the "cold" or ground leads to electrodes in the bottom halves of the jigs or molds which are fastened to the press platens. The whole setup consisting of hydraulic presses containing the jigs and molds is shielded to prevent high-frequency radiation from interfering with radio reception and to provide safety for the press operators. The shielding contains vertical sliding doors



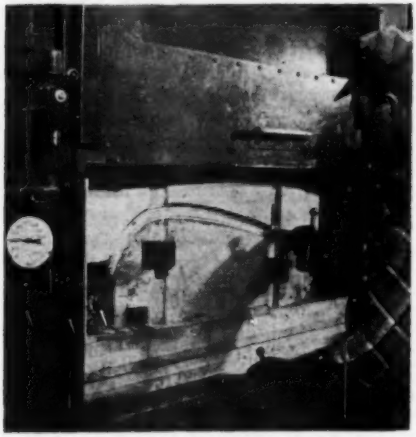
Bundles of glued veneer placed in position for molding in the high frequency laminating press.

for loading and unloading assemblies, and these doors have copper screen wire windows which permit the operators to view the work while the heat is turned on and still get adequate shielding. All doors have interlocking switches that cut off the power when any door is opened on any press in which the heat is turned on.

The heating cycles are timed to correspond to the loading and unloading periods, which gives lower operating voltages and more even heating than if faster cycles were used.

The phenolic resins and catalysts now in use are Durez Plastics, and are obtained from the Snyder Chemical Corporation, and are used singly or in mixtures with walnut shell flour to give the desired working properties from the different types of gluing to be done.

The electronic equipment consists of Thermex units from the Girdler Corporation. The control panels have push buttons for turning the power on and off and controlling the amount of power used, as well as automatic timers to cut off the power at any set time.



Pillar blank in mold after pressure has been applied and before the doors are closed preparatory to the high frequency curing.

Left and right pillar blanks after being molded in high frequency laminating presses. Center, after being shaped and ready for assembly in door frame.

The hydraulic presses used are either 75-ton Frisch presses for the heavy laminating jobs or lighter Ford presses made in the machine shop for finger joints and frame assemblies.

The jigs and molds used with this equipment are all made in the pattern shop.

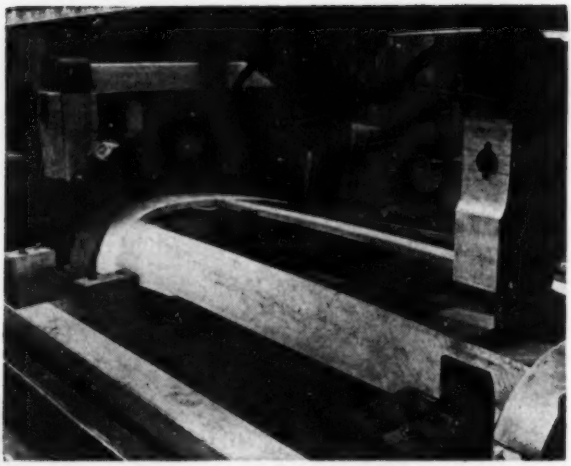
The complete setup including the electronic equipment is serviced and maintained by plant personnel.

Actual Operations

Three types of gluing are being done at the present time with electronic equipment, laminating blanks used in making "pillars" for the door and quarter panel frames, assembly door quarter panels and window frames, joining two pieces by finger joints for making the upper curved members of the window frames.

Laminating "Pillar" Blanks

Eighteen Frisch 75-ton presses, five



Assembled door frame in high frequency jig and press, showing press open ready to remove glued and cured frame.

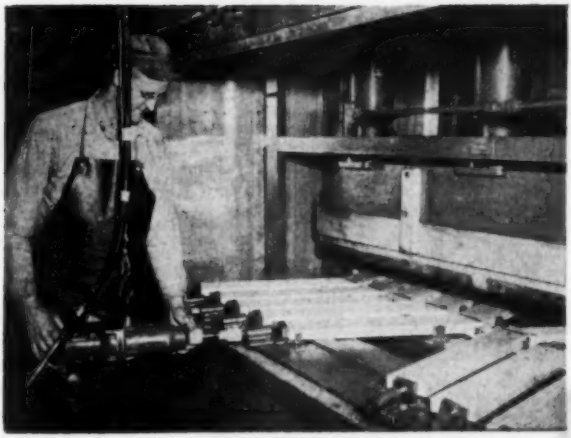
Thermex 12½ kilowatt units and two Black Brothers double roll glue spreaders are used in making "pillar" blanks. Four of the Thermex units and sixteen of the presses are arranged so that one unit serves four presses, one pair of which contains "pillar" blanks which are being cured while the other pair are being unloaded and loaded. These four units and their presses are used to make four types of "pillar" blanks; the front members for the Ford door panels, the rear members for the Ford and Mercury door panels, and the front and rear members of the quarter panels for the Ford and Mercury. The fifth Thermex unit serves two presses alternately, one of which is used making blanks for the front member of the Mercury door panel and the other for making additional blanks for the front member of the Ford door panel.

High frequency switches are used to feed power alternately from the oscillator to the presses containing blanks being cured and to the presses being loaded and unloaded.

Each press contains two sets of molds so that four "pillar" blanks are made with each heat, except in the case of the blank for the front member of the Mercury door panel and its mate when only two are made per heat.

The molds for making the blanks are constructed of hard maple which has been found best for strength, low heat loss, high frequency resistance, durability and stability. They are matched for shape, size and distance from the press platens; and the electrodes are also matched as to length, width and thickness so that they will all have the same thermal and electrical characteristics. This matching is essential since the wood between the "hot" electrodes and the press is part of the load on the oscillator as it is heated dielectrically, and must heat evenly if the blanks are to heat evenly. The distance between the "hot" electrodes and the press is large in proportion to the thickness of the blanks, so that this wood is heated more by conduction from the heated blanks through the electrodes than by the high frequency energy itself.

Elm has been found to be the best wood for making the bodies of the blanks which are eight to 10-ply thick, with the bodies of 1/8 or 5/32 inch elm and the faces of two 3/32 inch birch or



Closing of finger joints which will be subjected to high frequency gluing and curing.

maple. Some of the blanks as for the front member of the Mercury door panel which has compound curves have bottoms made of one or 2-ply maple to insure stability after removal from the molds.

The plywood stock used for making the blanks is sorted and tested for a moisture content of about eight percent, then sawed to size, run through the glue spreaders to give a spread of about 25 pounds of glue per 1000 square feet for each side, and stacked in piles required for the blanks. These piles are then loaded into the molds face up, placing them against inside stops and held in position by removable outside stops. They are then pressed to shape, the outside stops removed, the door closed and the power turned on.

No cauls are used between the blanks and the electrodes except in the case of the blank for the front member of the Mercury door panel, which because of its compound curves requires a thin elm caul next to the top electrode to prevent breakage of the face ply.

The combination of wood moisture, glue, heat, and pressure softens the wood and relieves strains; so that stops have to be used to arrest the motion of the press when the blanks have been compressed to the desired thickness. This is about 1/16 of an inch less than the original thickness of the pile of plywood stock, and not only insures the correct thickness, for the cured blanks, but maintains correct spacing between the electrodes which is necessary for uniform heating of the blanks.

The heating cycle for these blanks is not continuous, but is broken into two periods with the heat off between them. This intermittent method is necessary because each blank contains four or five pounds of wood and they would become too hot in the center before the outside was thoroughly cured, at the speed with which they are heated if a continuous heat was used. This method of heating also largely cancels out small variations in heating caused by differences in moisture content and other properties of the wood, so that they will cure more uniformly.

The uniformity with which the blanks are heated is the most important factor in making all the blanks of uniform shape, and the final shape of the uniformly shaped blanks is controlled by the amount of heat they receive. The blanks are left in the presses three to

five minutes after the heat is turned off, but with the pressure on to help stabilize them for shape. This short time does not give complete stability but results in a slight "spring back" while cooling. After cooling they are relatively stable.

The amount of heat used in curing them controls the "spring back" and the blanks are tested for shape shortly after removal from the presses, and more or less heat is used for the succeeding blank as is required to give the final correct shape. After leaving the presses the "pillar" blanks must go through a period of storage to gain more stability before being shaped into the actual "pillars" which are to be assembled in the frames for the doors and quarter panels of the station wagons.

The glues used for making laminated "pillars" consists of a mixture of 7/8 Snyder resin and 1/8 Durez resin plus walnut shell flour, and the catalyst used is 3/4 Snyder and 1/4 Durez.

Assembling Door, Quarter Panel, and Window Frames

One 12½ kilowatt Thermex unit serving four presses of Ford manufacture is used in making the frames for the Ford door panels. Each press contains one jig for assembling and curing a single frame and each frame has six joints. Two frames or twelve joints are cured at a time while the opposite presses are being unloaded and loaded.

One 12½ kilowatt Thermex unit and four Ford presses are used in the same way for assembling quarter panel frames, which contain ten joints each, so that here twenty joints are cured simultaneously.

One 12½ kilowatt unit serving two presses is used for the Mercury door frames of six joints each and both are cured in the same heat.

For the window frames four small 2½ kilowatt Thermex units are used, each serving two Ford presses, and each press contains the jig for a single window frame, which has three joints to be cured. These are heated alternately so here only three joints are cured at a time.

All these different frame joints are cured in the same type of jig in 3½ to 4 minutes of continuous heat. The frames are ready for shaping and finishing while still warm and soon after leaving the presses.

Since these joints are lap joints which vary in shape, size and thickness, all in a single frame; and all contain glue lines perpendicular to each other, one of which extends to the top surface of the frame, special jigs to prevent selective or glue line heating, to prevent arcing and to get uniform heating and speed of operation had to be designed.

This was done by placing the joints to be cured between two spacers of Ford fiber, one below and one above the joint, and of a size to match its size. These fibers are shaped on one side to fit the surfaces of the joints, and are made flat on the other side which is fastened to the electrodes.

The fibers are made of such a shape that the "hot" and "cold" electrodes are held parallel to each other and the same distance apart (two inches) for all the joints.

The "cold" electrodes in the bottom halves of the jigs are fastened with wood screws to a solid base made of maple, which is fastened to the press platen. The "cold" leads are connected to the press platen.

The "hot" electrodes are fastened to the top halves of the jig by means of wood screws and small wood screws are used to fasten the fiber to the electrodes.

The top halves of the jigs consist es-

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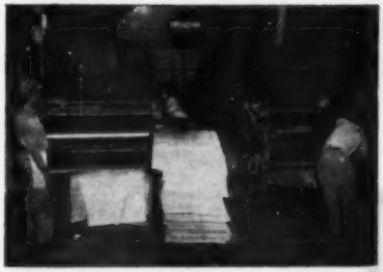
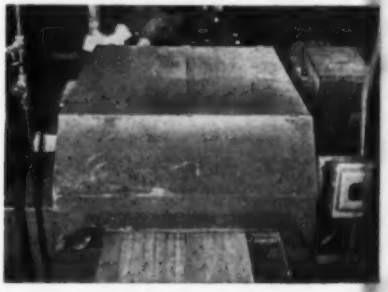


INTERMEDIATE TEMPERATURE CURING

SYNCO 128-CLW for laminating and assembly gluing exceeds high-performance standards of Specifications JAN-P-139, JAN-A-397, MIL-P-66A, CS-35-49, CS-45-49



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sentially of rigid maple pressure members pivoted at their centers by steel triangles to equalize the presses. These pressure members put pressure on two or three joints at a time and there are from two to four of them in the top half of each jig.

Between the "hot" electrode to which the top fiber is fastened and the pressure member, at each joint or point of pressure and outside the main high frequency field is placed a one-half inch rubber cushion. The top or "hot" electrode and its fiber can thus move slightly up and down with the compression of the half-inch rubber cushion and equalize the pressure on the various joints, in the jig, as well as compensate for any slight variation in the wood parts.

The "hot" electrodes are connected by "hot" leads of approximately equal length to the coaxial line from the oscillator, which helps to give uniform heating of the several joints.

Since the fibers are between the electrodes they are heated at the same time as the joints, but because of their position and different dielectric properties they do not get as hot and run about 100°F. cooler than the joints cured between them. They stand repeated heating, are easily worked and do not soften or lose their shape under heat and pressure. Because they are hot they prevent heat losses from the relatively thin joints to the metal electrodes and shorten the curing times, so that faster heating cycles can be used than without them.

Because the glue lines perpendicular to the electrodes are broken up by the fibers, selective heating and arcing along the glue lines is prevented.

Because the fibers constitute a substantial portion of the material between the electrodes and at the same time keep them parallel and equidistant, the

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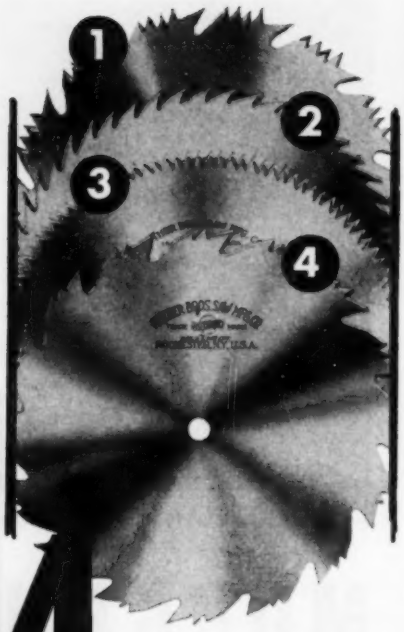

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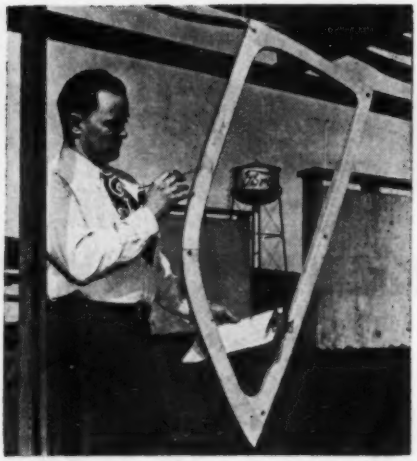

Exposure test of a completed window frame which has been assembled by high frequency gluing.

joints all "look alike" to the oscillator and uniform curing for all practical purposes is accomplished.

To keep glue squeeze-out from accumulating on the jigs and to prevent it from curing on the fibers, small paper squares are used between the fibers and the joints, and are replaced as needed.

Since the frame joints contain both flat and end grain, and since end grain is difficult to glue, these joints are given a priming coat of very thin glue which soaks into the wood leaving practically none on the surface. This priming coat is allowed to air dry before the bonding coat is applied. This makes the different surfaces of the joint with their different grains receive the bonding coat more nearly alike, which is an advantage with the high temperature and fast heating used. The priming coat also increases the adhesion of the bonding coat and helps stabilize the wood adjacent to the glue lines.

Both priming and bonding coats are applied by hand with brushes.

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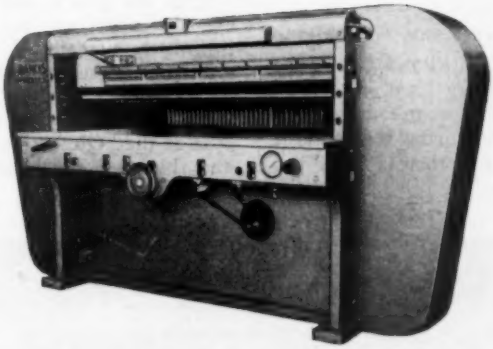

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The bonding coat consists of Snyder resin plus walnut shell flour, and its catalyst is a mixture of 3/4 Snyder catalyst and 1/4 Durez.

Repairs on door, quarter panels and window frames usually are not made with dielectric heating because after the parts have been shaped they would not properly fit the jigs. So they are assembled with clamps and the repair glue is Durez resin with Durez catalyst which is cured in ovens.

Making the Finger Joints

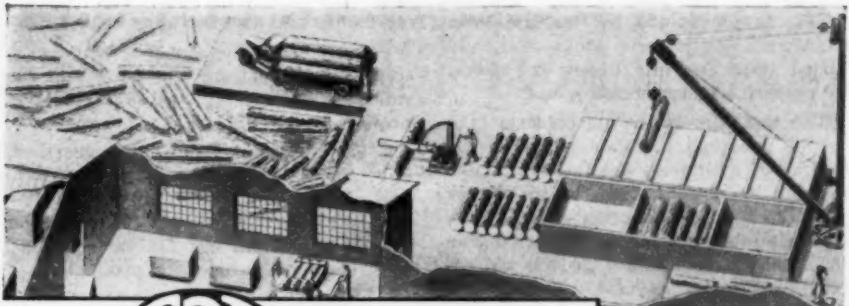
One Thermex 12½ kilowatt unit and two Ford presses are used in making the finger joints. The unit serves the presses alternately, curing the joints in one press while the other is being unloaded and loaded.

Ten finger joints are made at a time in each heat, five right and five left hand. One press makes the joints for the door windows and the other for the quarter windows.

The bonding coat of glue is applied to the finger joints without the use of a priming coat. Applicators made of aluminum that match the finger joints are used in applying the glue by hand.

The glue for the finger joints consists of a mixture of 7/8 Snyder and 1/8 Durez resins, plus walnut shell flour, and the catalyst used is a mixture of 3/4 Snyder and 1/4 Durez catalysts.

After the glue is applied to the fingers, the parts are put in the bottom jig which is made of steel except for a strip of fiber for heat insulation running down its center. The "cold" electrode covers this piece of fiber which is outside the high frequency electric field and this cold electrode is grounded to the steel jig.



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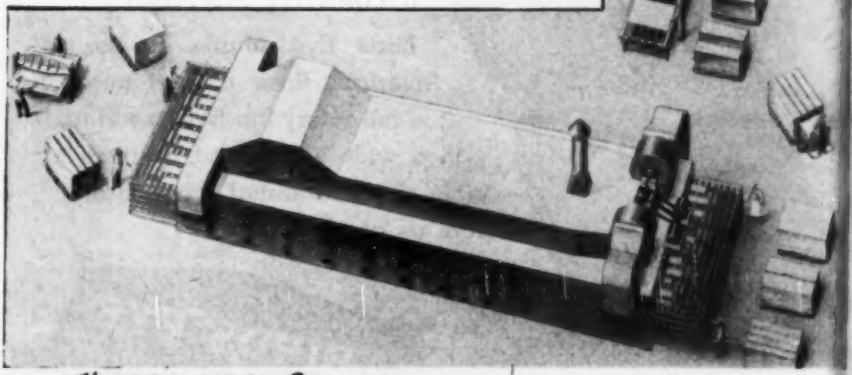

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The finger joints lie on the cold electrode, against end stops and side thrust stops and the fingers are closed by powerful screw pressure.

The top part of the jig consists of a maple pressure member operated by hydraulic cylinders. It is several times as high as the thickness of the finger joints to be cured, because it too is in a high frequency field and is part of the load on the oscillators. To the bottom of this pressure member is fastened a one-half inch rubber cushion outside the main electric field, and over this cushion is placed the hot electrode made of sheet copper, which rests directly on the finger joints when the press is closed. There is no fiber between the electrodes which are parallel and slightly wider than the joints to be cured.

New paper strips are placed between the electrodes and the joints for every heat to keep glue from sticking to the electrodes and accumulating on the jigs.

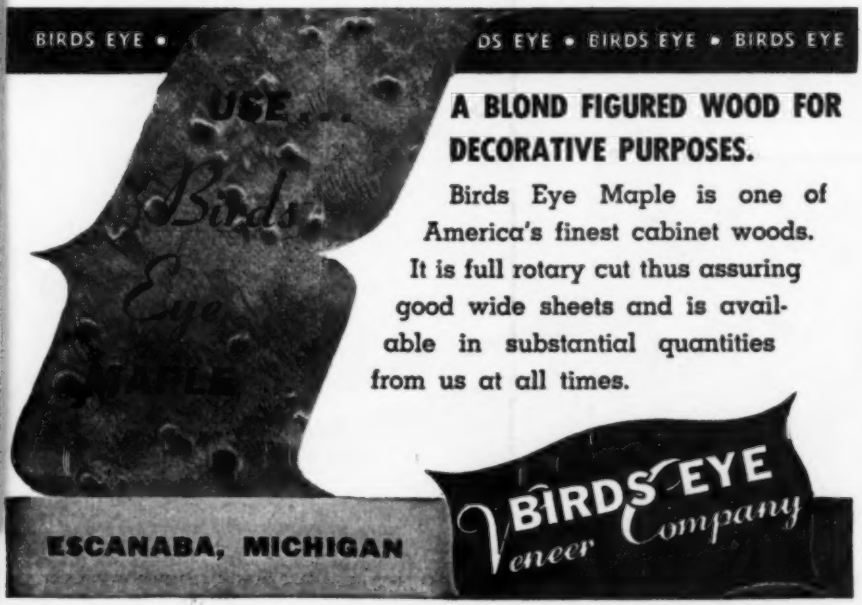
The curing cycles are 4½ minutes of continuous heat and the parts can be worked while still warm from the presses.

Other operations from those described have also been successfully worked out, one of which was the gluing of plywood panels to the wood frames as a second operation, but for various reasons were never used in production.

W. T. HUNTER

William T. Hunter, retired president of A. Schrader's Son, Inc., 470 Vanderbilt Ave., New York, and former vice president of the Scoville Manufacturing Co., died recently in New York. He was 71 and resided in Darien, Conn.

Mr. Hunter, who at his death was still a director of the Scoville Mfg. Co., retired May 1, 1949. He had been with the Schrader concern for more than 50 years.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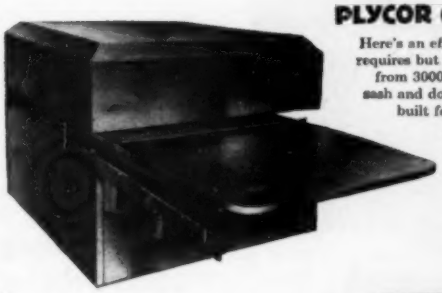

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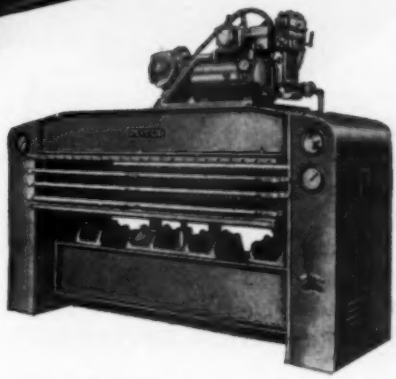

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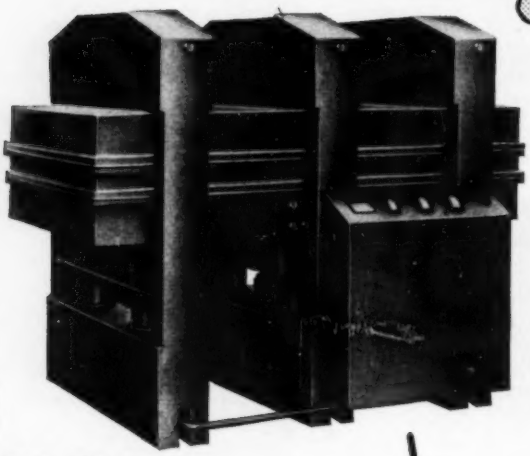

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Veneer and PLYWOOD

By Ned Bailey

Part IX

THIS article, which includes the uses of veneer, could be made into a large volume if each and every application and use were described in detail. Veneer and its multiple use in plywood has been receiving more and more attention from research and other engineers than any other one wood product.

I want to go back to the middle of the 19th century briefly as I believe at that time came a turning point in the manufacture of furniture. This turning point was brought about by the introduction of veneer into the manufacture of furniture. Up to that time the finest furniture was hand made, each piece representing the finest craftsmanship and skill, the pride of master workmen. It was slow, painstaking and laborious and naturally costly and available only to those with plenty of money.

Mechanization of furniture shops began about 1840 and with it came mass production. In some of these shops the quality was sacrificed to the quantity production desired. Highly figured veneers and ornate inlays were applied over poor quality materials and poorly fabricated products for the purpose of concealing the shoddy workmanship. Today's dictionaries still believe this condition to be true—which we know is anything but the fact—defining veneer as "a layer of more valuable or beautiful material over an inferior one." The public became aware of what was being done and for some time, and in some cases even now, has been and is prejudiced against veneered furniture and other products, preferring solid wood.

Veneering as it is done today, needs no defense and has many advantages and most of these are due to the progressive work of our manufacturers and their technologists and chemists. Methods of cutting and treating veneers have made them invaluable primary uses.

Veneer, as we know, is a comparatively thin sheet of wood of uniform thickness produced by peeling, slicing or sawing logs, bolts and flitches. Plywood is made up of sheets of veneer and other materials bonded together

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with a suitable adhesive. With the exception of containers such as baskets, crates, boxes, drums and certain special products where veneers are used as-is, the principal use of thin sheets of wood-veneer is in the production of plywood panels.

Fancy face veneers from carefully selected logs, burls, crotches, and stumps are usually beautifuly figured and are used as facings for plywood panels used in furniture and piano manufacture and for interior decorative paneling.

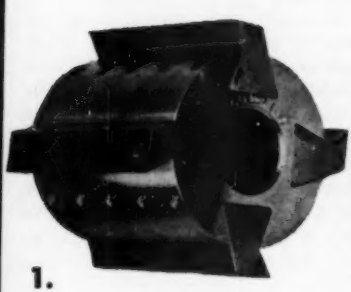
Industrial and commercial veneers are used for cross bands, cores and backs of plywood panels, concealed parts of furniture such as drawer bottoms, case and mirror backs, and dust sealers. As a rule this type of veneer is cut to order.

A large variety of veneer is cut for the container trade. Regulated by the sphere it is used for crates and packing cases, hampers, fruit and vegetable baskets and kits, meat, butter and picnic dishes, cheese boxes, drums and hoops and similar items. These veneers are called container veneer.

Softwood-veneer, a product of the west coast, is made mostly from Douglas fir, and Sitka spruce, Ponderosa pine, sugar pine, and Western white pine. About 80 percent of all softwood-veneer made in this country is made from Douglas fir. This veneer is used almost entirely for the fabrication of structural and interior plywood. Sitka spruce and Western pine provide container veneer for boxing citrus and other hard and soft fruits grown on the Pacific Coast.

Plywood doors first made an appreciable increase in production about 60 years ago when it was found that their strength and stability was far greater than those of solid lumber construction. Later on the flush or slab door because of its sturdiness and sanitary features

Marcoloy Carbide Knives are cutting production costs on many different jobs



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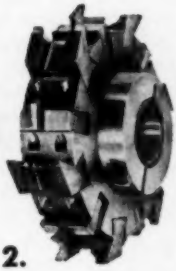

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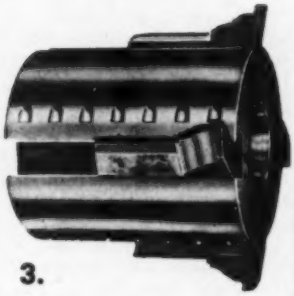

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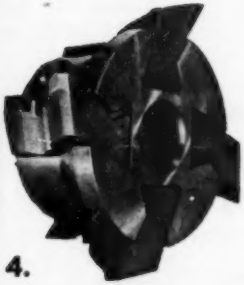

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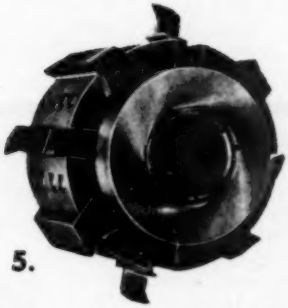

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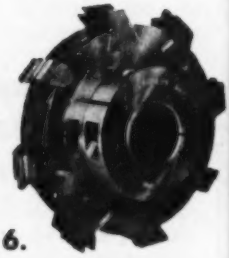

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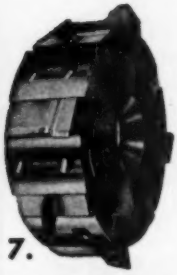

7.

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became quite popular, and still is, solid lumber could not be used for this purpose due to its vulnerable features, moisture and temperature variables. Because of their dimensionable stability, stiles and rails of panel doors came to be made of plywood.

The uses of plywood are increasing daily, such products as furniture, pianos, organs, radio cabinets, musical instruments, trucks, suitcases, coffins, baby carriages, buses, railroad and freight cars, automobiles, boats, airplanes, sheathing, sub-floors, partitions, concrete forms, bins, chutes, tennis rackets, small wheels, shaft bearings, trays, sink and countertops.

In the first paragraph of this article I mentioned that the progress made in this field was due to the attention it was receiving from research and other engineers. Many of these folks have been concentrating on the glues, gluing, and production techniques, materials and machinery.

Adhesives have contributed more than any other single element to bring plywood to its present usage. To be suitable for use in the manufacture of plywood and laminated structures an adhesive must be of such nature that it may be easily and uniformly spread over large or small surfaces, and when extenders are used, be compatible with them. Adhesives must not stain the veneer, particularly face stock, and they should not lose their bonding capacity with age, after they are cured. They should be, and many of them are, resistant to insect attack and bacteria and fungi action, and in some applications they must be water-resistant. The cost element also must be taken into consideration as few possess all the qualifications mentioned, the selection is regulated by both cost and use.

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There are several types of adhesives being used now in panel-plywood fabrication. The list given here does not include the many subdivisions of these types. There are animal glues, starch glues, vegetable-protein glues, blood-albumin glues, casein glues and synthetic-resin adhesives and to some extent liquid fish glues. The latter is used mostly for repair work.

The oldest in use are the animal, fish and blood-albumin glues. In some quarters it is believed that one of these three types was used in ancient times for plywood gluing. Competition to animal glues became noticeable about 40-odd years ago, insofar as our industry is concerned. Starch glues made their appearance about that time and during World War I casein adhesives were developed on a commercial basis. A soy bean derivative, vegetable-protein glue put in its appearance about 38 years ago. Although enjoying fair popularity in the shops in Europe, blood-albumin glues are not used to any large extent here except in the manufacture of water-resistant panels. The original of a now large and diversified group of synthetic resin adhesives came on the American market about 1935. World War II saw the rapid development of resin-type adhesives and their use in the plywood industry since that time has been quite general. I do not mean to imply that synthetic resins have entirely replaced other types of adhesives as many plywood plants still consume large quantities of animal, starch, protein and casein glues.

Animal glues, which are derived from the hides, bones and the fleshings of cattle, horses, sheep and other animals, are usually sold in sheet, cake, flake or powdered form. To prepare animal glue for use, the dry glue is placed in

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pure cold water at a ratio of one to the other according to the manufacturer's specifications. This mixture should be allowed to stand overnight if possible then heated to not more than 140° F. in a double-boiler or jacketed gluepot. This, or a slightly lower heat level, should be maintained throughout the gluing operation. Usually the best results are obtained when the surfaces to be bonded are preheated or the workroom maintained at about 80°F. during the bonding period. In spite of certain inherent weaknesses, animal glue is essentially an all-purpose glue, in use being neither waterproof nor heatproof. However, many years of satisfactory service can be expected from joints bonded with a good grade of animal glue, that is, under normal atmospheric conditions.

Known to the trade as vegetable glues, starch glues are water-soluble materials made largely from starch obtained from the roots of cassava from which commercial tapioca is made. As a general rule starch glues are offered in the form of a dry powder composed of blended grades of cassava flour incorporated with converting chemicals, or as a flour or blend of flours to which the user adds a quantity of caustic soda at the time of mixing and in accordance with the manufacturers' directions These glues have an almost indefinite storage life when kept dry and properly protected. They are simple to prepare and low in price. Except when high humidities occur, the cured glue joints are tough, strong and long lasting. On the other hand when exposed to unfavorable conditions of exposure, the starch glues are quickly subject to the ravages of insects and fungi. These vegetable glues are thick, viscous fluids wholly unsuitable for application with brush or spray and can therefore only be used with mechanical spreaders. As

they set quickly at room temperatures, assembly time should not exceed 15 minutes if maximum bond strength is desired. Good joints are obtained with pressures of from 75 to 100 p.s.i.

Although the use of caseins can be traced back to the middle ages, they received their most rapid development and improvement commercially during World War I. Casein, a derivative of skimmed milk, is obtained by adding a quantity of acetic or other acid to milk and heating the mixture to about 100°F. This sours the milk, quickly separating the curd and whey. Thoroughly washed and dried the curd is reduced to a wheat flour consistency. Casein glues are offered to the trade in dry powder form, composed of a standardized mixture of casein, hydrated lime and alkaline solutions or salts. These mixtures are made up to supply a specific demand or use, long assembly periods are the feature of some while others are claimed to be highly water-resistant. To use, just mix with water as the manufacturer directs. Wet mixes are made by mixing raw casein powder with water, lime and other ingredients according to the particular needs of the manufacturer.

Casein glues are satisfactory for many uses. Some are highly water resistant if not subjected to prolonged immersion as a boat hull would receive, or for a construction that would be exposed continuosly to very high humidities. Unless fortified with suitable toxic agents it will deteriorate in the presence of certain fungi. Because of their alkalinity they are well suited for bonding only woods such as Southern yellow pine.

About 1923 the first soybean glues made their appearance and by 1926 were in general use for structural Douglas fir plywood. They are cheap

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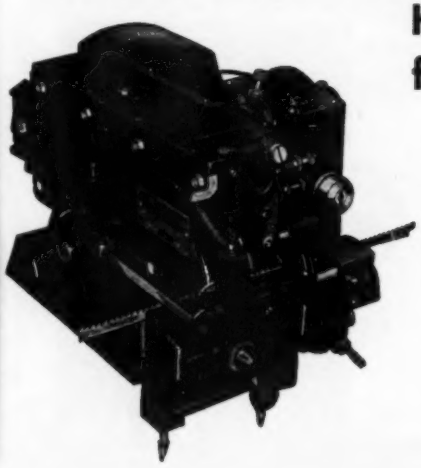
and the best of them are very water resistant. They are sold as yellowish powders comprised of soybean meal mixed with caustic soda, hydrated lime, sodium silicate and a water proofing ingredient. Soybean glues are not tacky as are those formerly mentioned, and although they resemble wet plaster in consistency they are readily applied in mechanical spreaders, and can be cold or hot pressed as desired. When soybean glues are used veneers should be down below 5 percent moisture. Cold press assembly time of 25 minutes and not more than 15 minutes for hot pressing is prescribed.

An important by-product of the abbattoirs, dried blood or blood-albumin glues were developed with the advent of the first World War. Prior to the second World War considerable quantities of this type glue were shipped to the Scandinavian countries. Since then its use has been gradually increasing in this country. Blood-albumin glues, if hot pressed offer great resistance to hot or cold water, however, their bond strength is appreciably affected in aging although this trouble we are told has been eliminated in recent tests. Dried blood used as an extender in casein glues improves their water resistance.

European plywood plants were using synthetic-resin adhesives back before 1935. At that time "Tego" a phenolic-formaldehyde resin in dry sheet form, became available in commercial quantities in the United States. Other types of resin adhesives have been making their appearance ever since—World War II giving their production much impetus. The synthetic-resin type adhesives are either of the thermosetting or thermoplastic types. The former are those which, when cured under heat and pressure "set" or harden forming films of great tenacity and strength. During their curing cycle, the reactions of such

Insert Saw . . . then forget it

K5 does the rest . . . files, sets, joints



K5 files, sets and joints band saws in one set up. It formerly required two machines to do this work. Now one can do both and in addition do it in half the time. The saw is rigidly locked by steel cam while being filed and set. The teeth are filed and set and joined with absolute uniformity. The result yields cleaner, faster cutting with longer periods between replacements.

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adhesives are not reversible, that is to say, upon the total cure the bonding matrix will not soften even under repeated applications of heat. On the other hand, the thermoplastic adhesives remain soft until cooled. Here the reaction is reversible to the extent, that upon reheating, the resin will again soften, hardening again when it is cooled off.

The thermoplastic-resin adhesives have not had as broad a use as yet in the plywood industry as have the thermosetting types, being used more in making molded panels by the bag-molding process.

In the American plywood industry there are two types of thermosetting-resin adhesives that are rather important, the phenol-formaldehyde series and the urea-formaldehyde group. Two others are the resorcinol-formaldehyde and the melamine-formaldehyde resins, both growing in popularity. These adhesives are available in sheet, liquid or powder form. Unfortunately, we don't have room here to describe the many types of phenol-formaldehyde-resin adhesives in this article. I hope to do so at some future date when my information on the subject is more complete.

The End

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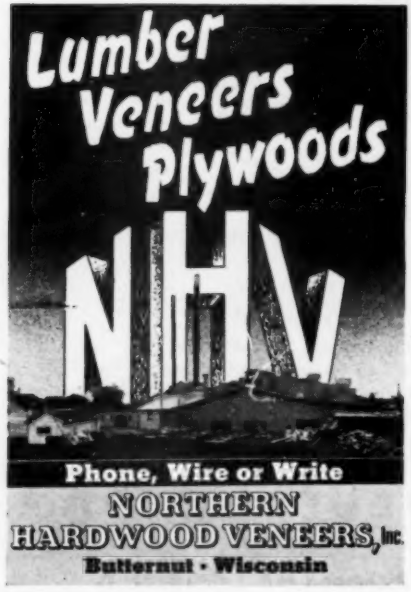

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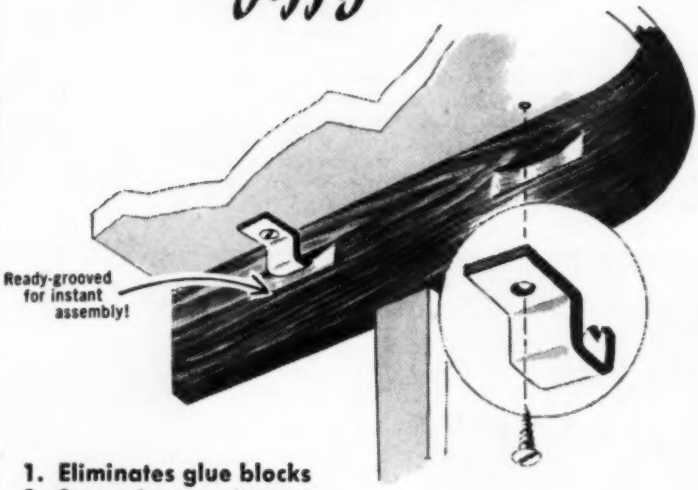

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MOLDED PLYWOOD
And Its Increasing Use in Furniture

With the advent of synthetic adhesives in the last two decades, which permitted the furthering of the old art of veneering, molded plywood as a wood utilizer has come into its own. The moisture resistance, the invisible glue line and the unusual strength that synthetic adhesives added to the already well known characteristics of plywood were the major factors in bringing to life this new material.

Here is a material that has the natural warmth of wood, because it is wood, and yet makes possible bending or forming, previously attributed to metals only. In fact, when properly constructed, molded plywood has many times the tensile strength of steel of comparable weight.

However, with all the natural value of this material, it has found a very rocky road in coming into its own in the furniture industry. This has primarily been due to the fact that the equipment required and the "know-how" for mass production, was slow in developing and thereby made the ultimate furniture product quite expensive. Another reason for this rocky road was due to the fact that the public feared its lightness and looked upon its modern simple lines as unusual and certainly not durable. This fear is quickly being dissipated by the great amount of publicity that molded plywood products, particularly in chairs, have gotten in home furnishings magazines and newspaper articles. Recognition of molded plywood has been helped further by chrome which has brought into the home, particularly the kitchen and dinette, a light, simple, modern dinette set that has completely displaced the heavy wooden bases that were so well known previously. Chrome however is not a warm material and it is only reasonable to assume that molded plywood which can carry out

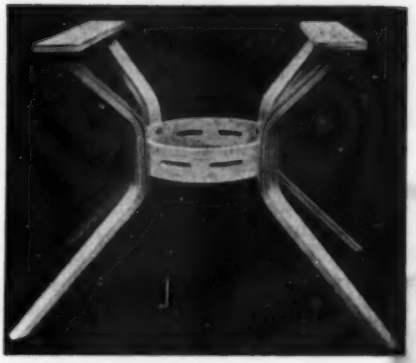
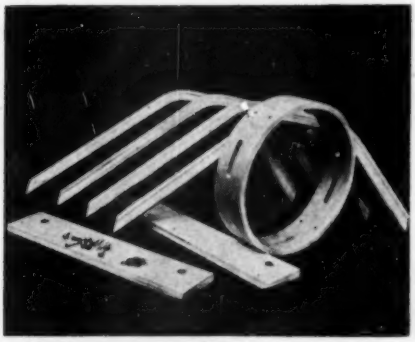
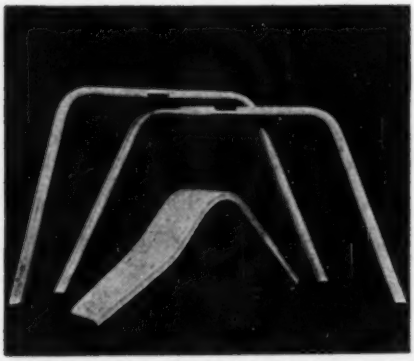


Table base assembled.



Knocked down table base.



Knocked down chair frame.

all of the modern lines that chrome encompasses, can go a step further and add warmth to the home.

Up to the present moment this was a dream that many fabricators of molded plywood had but could not actually produce, because the price was far beyond what was commonly accepted by the industry. Further advances in manufacturing "know-how" and equipment is quickly overcoming this problem and an excellent example of

Chair frame assembled.

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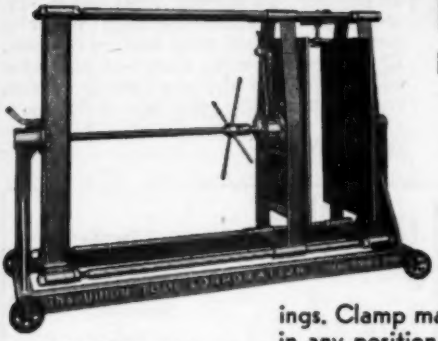

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Write for your free copy, "The How's and Why's of Wood Gluing," by Thomas D. Perry.

•

Union makes equipment for every standard production job in wood gluing. Also designs and makes machines for special applications—including machines for electronic gluing. Write for data on the complete Union line.

UNION SERVES OVER 1,600 SATISFIED CUSTOMERS

UNION TOOL CORP.

300 EAST MARKET ST., WARSAW, INDIANA, U. S. A.

USERS SAY UNION CUTS COSTS — SPEEDS PRODUCTION

that is the molded plywood base and chair shown in the accompanying photographs. These items are priced so that the mass assembler of dinette furniture can definitely incorporate them into a moderately priced set.

Helping molded plywood as it did chrome, is the fact that mass production methods have been devised in making plastic tops using simulated wood grain patterns and having plastic self-edges. Up to the present time it was only possible to use a metal molding as a means of economically edge banding a plastic top.

Now this is no longer necessary. There are many potential uses for molded plywood. This is particularly true with the ever growing call for the use of wood grain plastic top materials.

There are several advertisers in WOOD WORKING DIGEST who can

supply molded plywood in various sizes and forms. We suggest that if you are interested in learning how the material may be used in your own products, you write some of these firms. Or you may write directly to our office and we shall refer your request to a number of companies supplying this material.

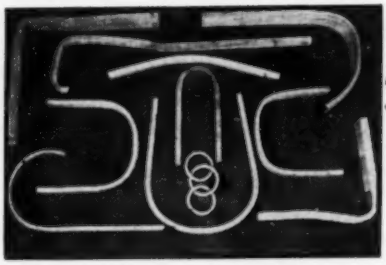
When your ship comes in, most of your relatives are standing on the dock.

— **Minneapolis Star**

ELECTRIC MOTOR DRIVES FOR PULP MILLS

On-the-spot scenes are shown in this bulletin featuring electric motor drives for pulp mills. The bulletin describes drives for barkers, saws, chippers, grinders, materials handling, washers, pumps and allied pulp mill equipment. Illustrates the wide choice of available equipment and the application of this equipment to the pulp mill industry.

Write to General Electric, Schenectady 5, N.Y.



BENT WOOD

If it Bends We'll Bend It!

Standard and Custom Bends Our Specialty

Sorensen & Peters, Inc.

Box 145-H Westerly, R.I.

You may depend on

Sta-Warm

ELECTRIC GLUE POTS

½ to 11 qt. capacities. Variable thermostat, removable inner liner, brush wiper, 110-v. A-C.

Sta-Warm ELECTRIC CO.

105 N. CHESTNUT ST. • RAVENNA OHIO

Prompt Delivery Factory Trucks

Size 1
24" x 48"
Size 2
30" x 48"
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30" x 60"

Ask For Literature

EFFICIENT, ECONOMICAL

Jakes Foundry Co.

400 - 29th Ave. Nashville, Tenn.

CHOICE VENEERS

Come from Historic Giant

The interior of the Citizen's National Bank of Piqua, Ohio, is a setting of historic beauty. The furniture, counter paneling and interior trim are made from a venerable American walnut tree which once was owned and prized by George Washington.

Recently harvested by the Hartzell Industries of Piqua, this famous walnut tree produced approximately 45,000 feet of handsomely figured veneers and lumber that will ultimately grace the furniture and interiors of many American homes, offices, and public buildings.

Hailed by lumbermen as one of the largest walnut trees obtained in many years, it towered 70 feet in the air with a crown spread greater than its height. Its trunk measured 50" in diameter, exclusive of bark, almost five feet above the ground.

A spokesman for Hartzell Industries reports that the tree cut into 15 logs totaling 3,700 log feet, which is equivalent to two large trailer-truck loads, or one railroad carload. The overall length of the trunk log was 16 feet; its weight 10 tons. It contained 1,996 log feet of lumber.

The remainder of the logs cut from the upper trunk and limbs weighed another 10 tons. These logs are being turned into lumber and gunstocks. Walnut, being the perfect gunstock wood, has served America and its Allies in every war during and since the time of George Washington.

For more than 300 years, according to its growth rings, this colossus of the wilderness stood in a huge timber tract in an area which later became part of the state of West Virginia. In Colonial times this tract was known as the "Pocatalico Survey," of which George Washington eventually became the sole owner. Both the vast land tract and the giant walnut tree are mentioned in his diary.

Counters and writing desk are richly paneled with beautiful American walnut from George Washington's famous tree.

Historians refer to this venerable walnut tree as a landmark in wilderness where trails were poorly marked, if at all. It served as a guide for General Andrew Lewis and 1,100 frontiersmen in their westward march in 1774 to defeat the Indians under Chief Cornstalk at Point Pleasant, West Virginia. Daniel Boone and other explorers probably rested in its shade. Later, in the Civil war, it was a mute witness to the rout of Confederate troops, hotly pursued by Union troops advancing to Scary, Charleston, and Gauley Bridge.

This famous walnut tree had reached maturity many years before it was harvested but nevertheless had just begun to show its "declining years." It served well during its life but will render even a greater service for decades to come.

ONE HAND SAW STANDS OUT!

SPEEDS WORK

Ideal for Cornices

Designed Manufactured & Patented by Scintilla, Ltd., Switzerland, since 1944.

Sold & Serviced in Principal Cities Throughout U.S.A.

VICTOR J. KRIEG, Inc.

Sole U.S. Representative for Scintilla, Ltd. Switzerland
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LOngacre 4-6487
Some Sales Territories Available

LESTO

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SAWS

- 2" Hard or Soft Wood
- Curves of All Types
- Insertions
- Plastics

ATTITUDES + and Safety

This is the second article we have published recently on the human side of safety. Before guards, rules or safety clothing can solve the problem, we must consider the human being and his relationship to the entire subject. This article appeared in the April Newsletter of the Wood Products Section, National Safety Council.

MAN'S need for safety is as old as man himself. Perhaps the first safety movement began when the first man took up a club to ward off wild beasts or unfriendly neighbors. It is not my intention to discuss the part mechanical means play in preventing personal injuries, but I want to invite your attention to the value of attitudes in safety.

I believe that there is no more neglected asset in all industry today than that of the workman's viewpoint—his attitude. If any of us doubt the powerful influence of attitudes, we might ask ourselves these or similar questions:

Why does a man labor hard day after day, year after year, trying to provide for his family? Why does an athlete go on and on till he drops exhausted? Why does a man play golf till he can hardly walk?

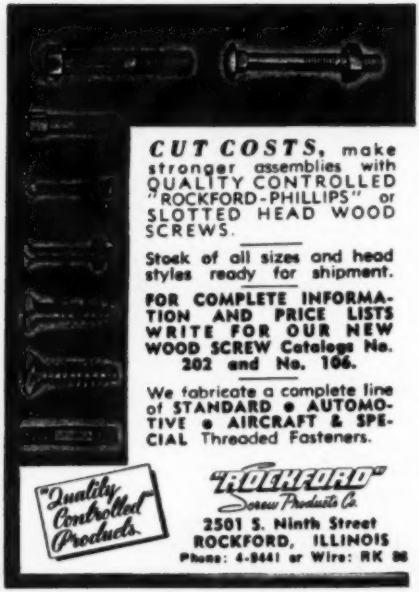
The answer lies in his attitude—nothing in the world but a state of mind. We see that what man accomplishes is directly proportional to his attitude. Therefore, it behooves us to pay more attention to this valuable factor in safety, and, in fact, in all phases of industry.

Our greatest problem in industrial safety is to get men to know and realize that their greatest dangers are not outside but within themselves. So we must put forth an organized and determined effort to help our men get the proper attitude toward their own safety and then to practice it.

The supervisor who proves himself most useful in this vital work is the one who realizes that just as a headache is an indication of something wrong within the individual, so an accident is usually an indication that there is something wrong within the working system.

Many supervisors as well as workmen were, and some still are, slow in warming up to that viewpoint. They aren't hardboiled—they just don't see the light. It's our job to help them gain and hold the right viewpoint. Thus you see the size of the task that confronts those interested in safety. Changing viewpoints is a slow, painful job.

Since one source of a high percentage of accidents to workmen is improper attitude, we must help the workman gain the proper attitude.


CUT COSTS, make stronger assemblies with QUALITY CONTROLLED "ROCKFORD-PHILLIPS" or SLOTTED HEAD WOOD SCREWS.
Stock of all sizes and head styles ready for shipment.
FOR COMPLETE INFORMATION AND PRICE LISTS WRITE FOR OUR NEW WOOD SCREW Catalogs No. 202 and No. 106.
We fabricate a complete line of STANDARD • AUTOMOTIVE • AIRCRAFT & SPECIAL Threaded Fasteners.
"Quality Controlled" Products.
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We must give more help to the new employee if we would further reduce our accidents. New environment, desire to make good, mental confusion because of so many new things, and mental distraction are some of the factors which create greater hazard for the new employee. A kindly personal interest, assurance of his own ability, a friendly and helpful attitude on the part of the supervisor will help the situation immensely.

Thus we move on to proper training. If, as we believe, a man's efficiency in coordinating is largely dependent upon his state of mind, then the supervisor must leave no stone unturned in an attempt to help that man. If the foreman doesn't offer that help, where or from whom will it ever come?

No foreman has a better opportunity of showing that he is exceptional than to show his efficiency by the elimination of personal injuries in his department. It may be fair to ask any foreman what he is doing along this line. Yes, we realize that many of the things presented to the mind do not register. Hence the workman may truly plead ignorance until the foreman has repeated often enough that the workman does really know.

Knowing means what the workman knows—not what the foreman knows. Knowing, plus right attitude, will greatly reduce accidents.

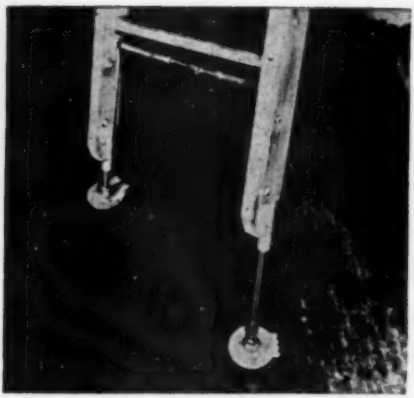
SAFER LADDERS

A new ladder stabilizer that makes any kind of ladder sure footed for greater safety is now being distributed by Mine Safety Appliances Company, Pittsburgh, Pa.

The Hydra-Lizer (hydraulic ladder-stabilizer) is an adjustable steel attachment for the lower end of straight or extension ladders. It provides safe footing for ladders in places where the two legs would not be on the same level, and can be used on any surface regardless of contour.

The Hydra-Lizer assembly consists of two steel legs which act as plungers in vertical tubes attached to the lower end of ladder rails. Each leg has a swiveled shoe attached to its lower end by a ball and socket joint. Each shoe, a hardened steel plate with a diameter of 3½ inches, has a rubber and cord sole ⅜-inch thick vulcanized to it. The sole, with concentric circular grooves about $\frac{3}{16}$-inch deep, will serve as a gripper on most hard surfaces.

The vertical tubes which house the legs or plungers are cross-connected near their upper ends by steel telescoping valve tubes leading to a central valve block. The valve assembly adjusts to any ladder width between 17 and 29 inches and fits straight, as well as flare base ladders. The entire assembly is filled with oil above the plungers. Opening the valve permits oil to move from one side of the system to the other. When one leg moves up to



adjust itself automatically to a difference in level, the other leg moves down a corresponding distance.

When the valve is closed, the system is locked so that neither leg can move further into its vertical tube. Loads up to 1000 pounds are supported by the assembly.

PLANT PROTECTION

Instructive information to guide watchmen, guards, supervising personnel and management engaged in defense production, is contained in the revised manual entitled "Plant Protection for National Defense," just published by Detex Watchclock Corporation, 76 Varick Street, New York 13, N. Y.

The original edition, widely used by defense plants during World War II, has been brought up to date in the light of the new threat of an atomic war. It is designed to solve plant protection problems by instituting security systems for preventing loss of life, damage to property and sabotage of war material.

The training of watching personnel, the planning of hourly routes and other important data for forestalling enemy agents, are contained in this booklet. It will be sent free upon request to any manufacturer now engaged in, or likely to get government orders.

TEST YOUR LUMBER
The Most Modern Way

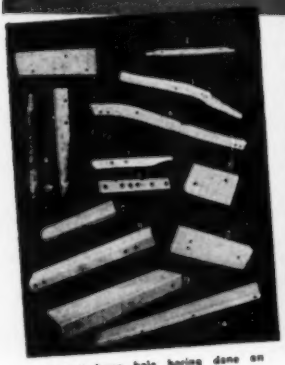
MOISTURE REGISTER

● A fast and easy way to test the moisture content of lumber or veneer. The RF4 type shown is used to test finished or rough lumber. We also carry the V2 type for veneer testing. No needles—finished pieces may be tested without marring the surface. The instrument tests accurately as low as 0 moisture content. Portable, fast and accurate, it is guaranteed for one year and comes complete with fabrikoid carrying case.

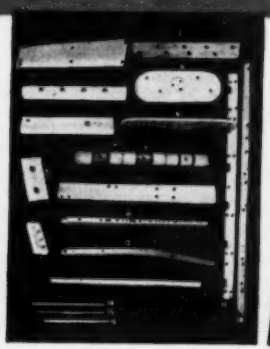
THE STANDARD DRY KILN CO.
798 S. HARDING ST. • INDIANAPOLIS, INDIANA

FOR A BORING JOB OF ANY DESCRIPTION—
USE ROOT MACHINERY ... FLEXIBLE — PRODUCTIVE — ACCURATE

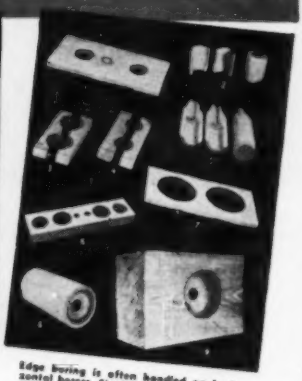
There's a Root Machine for every boring job.



Typical large hole boring done on heavy duty Root Borers.



A variety of samples of work done on Root gang borers. Vertical gang borers available in 12 different sizes.



Edge boring is often handled on horizontal borers. Single spindle borers with small cluster heads are often used for small pieces. Single and double end chucking machines available also.

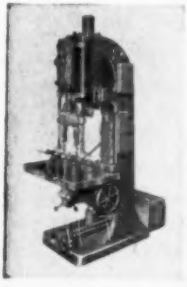
For large or deep hole boring, rugged machines with ample reserve power for swinging big cutters are available.

For cluster boring of regularly or irregularly spaced holes, there is a variety of vertical gang and horizontal borers to select from.

"Fingertip" control of feeding pressures allows just the right amount of feed from the lightest to the heaviest boring jobs.

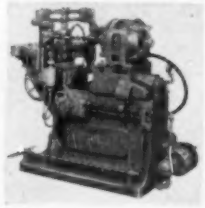
Send samples or sketches of your boring jobs for illustrated literature and free estimate—no obligation.

A Few of Our 45 Different Boring Machines

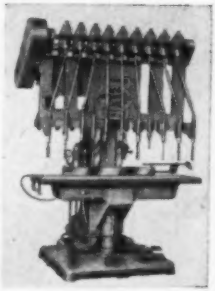


Model G-300 Heavy Duty Machine

Model D-360 Horizontal Borer



Model D-210 Heavy Duty Machine



Model CH Gang Borer

B. M. ROOT CO. YORK, PA.

WOOD Industry Notes

WOODWORKING MACHINERY ELECTS

Ray C. DuBrucq of the Crescent Machine Div., Rockwell Mfg. Co., Leetonia, Ohio, was re-elected president of the Association of Manufacturers of Woodworking Machinery at their 51st Annual Meeting held at the Warwick Hotel, Philadelphia, late in April. The following officers were also re-elected for the current year:

J. H. Petter, Buss Machine Works, Holland, Mich., vice-president.

F. G. Walker, Jones Superior Mach. Co., Chicago, treasurer.

George F. Newman, Jr., Newman Mach. Co., Greensboro, N. C., secretary.

Members of the executive committee also re-elected are: V. E. Martin, Yates-American Mach. Co., Beloit, Wis.; P. L. Mattison, Mattison Mach. Wks., Rockford, Ill.; M. D. Baldwin, Oliver Mach. Co., Grand Rapids, Mich.; E. J. Smith, H. B. Smith Mach. Co., Smithville, N. J.

There was a large attendance to hear Roy A. Peterson, Chief of the Woodworking section of the NPA discuss various regulations affecting the woodworking machinery industry. John M. Bulkley, Acting Director of the Industrial Materials and Manufactured Goods Division, Office of Price Stabilization spoke on the anticipated OPS regulation for machinery manufacturers.

SKILSAW OPENS NEW BRANCH

The Skilsaw Company, manufacturers of portable power tools, have opened a new factory sales and service branch in Milwaukee, Wisconsin. They have also established similar outlets in Denver, Colo., and Spokane, Wash. This brings their total of sales and service branches throughout the United States and Canada to 33.

These branches stock a complete supply of replacement parts and accessories for all Skil portable tools, plus space for diplay and demonstration. Each office is equipped to give on-the-spot factory service to their areas.

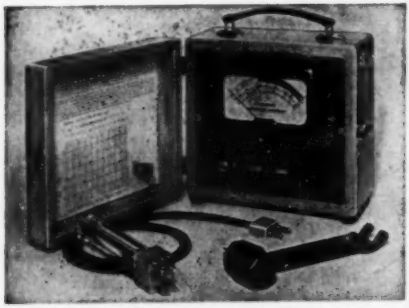
NEW PLANT FOR BORDEN

Plans to construct a formaldehyde and liquid urea resin manufacturing plant on the outskirts of Demopolis, Ala., have been announced by the Borden Company's Chemical Division. This will be the first plant in the southeastern states to produce formaldehyde.

Construction work on the outdoor type of distillation plant, which will cover about 5 of the 20 acres, will soon begin. Completion is scheduled for the first part of 1952.

The Demopolis operation will be Borden's second chemical plant in the south. The other plant is in Kernersville, N.C., built in 1946 for the manufacture of liquid urea resin glue primarily for the southern furniture industry. The new plant will be geared to produce about 2,000,000 pounds of liquid urea resin per month during the first year of operation.

Prove These Facts Yourself



Delmhorst Moisture Detector, Model RC-1

Try it 10 days Free! — Cut Costs, Improve Quality 4 Ways

- For rapid moisture tests of any wood product—from timber, poles and lumber, to finest veneers — without loss of material.
- To know whether the wood contains the right moisture content for storage, process or shipment.
- To test the moisture content, distribution or gradient of moisture within a single piece of wood or kiln load.
- To sort stock of equal moisture content for loading the kiln; to tell whether or not the stock is ready to come from the kiln.

Accurate, Easy-to-Use

There are no conversion tables required—no calculations to make with a Delmhorst Moisture Detector—merely read the correct percentage of moisture content *direct* from the dial! . . . And you get precise readings not in one, but *three moisture ranges:* 6 to 12% (kiln dry range); 12 to 22% (air dry range); and 22 to 65% (green range). *(The Model RC-1 is fully guaranteed for 1 year, except battery replacement).*

Send for Complete Information

Fill in the coupon below to get full details. Better still, find out for yourself the savings you'll make with a Delmhorst Moisture Detector —try one *free* for 10 days without obligation. Mail the coupon *today.*

DELMHORST INSTRUMENT COMPANY
BOONTON, NEW JERSEY

☐ Please send, without obligation, a Model RC-1 for 10 days free trial.

☐ Please send complete information.

Name .....

Firm .....

Address .....

City and State .....

Appointments

Black & Decker directors elected **Alonzo G. Decker** president at a recent board meeting. Mr. Decker is a co-founder of the firm with S. Duncan Black, who recently died. Mr. Decker has devoted his efforts to the design and manufacturing phases of the business since its inception in 1910. He had much to do with developing the first "universal" motor to be used in a portable electrical tool.

I. R. Walker

Alonzo G. Decker

I. R. Walker has been elected a vice president of R. Hoe & Co., Inc., printing machinery and saw manufacturer of New York City. Mr. Walker, who has been general manager of the saw division since September 1950, now becomes vice president and general manager of the division.

The Binks Manufacturing Company of Chicago, makers of spray painting and finishing equipment, have added a Pump Division. This division deals primarily with material handling pumps. **Karl W. Osterstrom,** a specialist in the design and development of air operated hydraulic pumps, has been appointed manager of the new division.

Karl W. Osterstrom

Richard J. Brown

Richard J. Brown has been appointed advertising and promotion manager of the Delta Power Tool Division of the Rockwell Mfg. Co. He will make his headquarters in Milwaukee.

John R. Wanamaker, great grandson of the late John Wanamaker, has been elected to the board of directors of Henry Disston & Sons, Inc.

The Davis Plywood Corporation has added **William H. Fleming** to its general sales staff. Mr. Fleming will handle special assignments on plastics and other decorative specialties.

W. O. Erickson

Wm. H. Fleming

Warren O. Erickson has joined the technical department of the Plaskon Div., Libbey-Owens-Ford Glass Co. where he will participate in research on industrial resins.

Ericsson Merritt, Inc., Lockport, N.Y. announces the appointment of **Lyman A. Spalding** as vice president and sales manager. Spalding has been with the company since 1937.

Edwin B. McConville, formerly vice president and treasurer of Skilsaw, Inc., Chicago manufacturer of portable power tools, has been elected executive vice president. Mr. McConville has been with the Company since 1942.

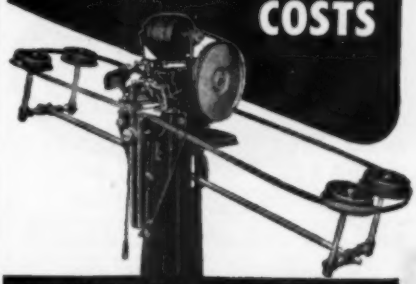
E. B. McConville

E. R. Graebner

Masonite Corporation, Chicago, announces some changes in their person-

Foley Sharpened Saws

CUT HIGH LABOR COSTS



NEW MODEL 61 FOLEY AUTOMATIC SAW FILER

Your saw operator's production jumps 25 to 40% when the saw he uses is sharpened on a New Model 61 Foley Automatic Saw Filer. His saw will cut faster, smoother, run cooler and *stay sharp longer.*

Prove it by 30 DAY TRIAL in Your Own Shop

Try the Foley Automatic Saw Filer for 30 days in your own shop. You'll be under no obligation. See how it sharpens your hand saws, band saws up to 4" wide and cross-cut circular saws 3" to 24" in diameter. Notice how the Foley Automatic Saw Filer automatically corrects uneven teeth caused by poor filing and restores them to even size, shape and spacing. You'll say the Foley Automatic Saw Filer is a "must" for every well run woodworking plant.

Free Book Tells How

The instruction book that goes with every Foley Automatic Saw Filer is yours for the asking. Here you can read how inaccuracies are eliminated through simple and positive adjustments. This book does a double job . . . helps you cut production costs with better cutting saws and shows you how to lower your saw maintenance costs.

FOLEY MFG. CO. 3351 N.E. 5th St.
Minneapolis 18, Minn.

Please send instruction book and information on 30-day trial offer.

Name .....

Address .....

NEW "Starrett SKIP-TOOTH" BAND SAW BLADE

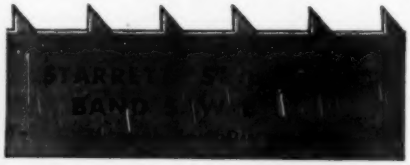
★ **Cuts Faster and Cleaner**
★ **Cuts Any Material**
★ **Outlasts All Other Blades**

One Starrett "Skip-Tooth" outlasts several ordinary band saws . . . holds its keen cutting edge until the teeth are completely worn out . . . saves all resharpening and resetting expense . . . cuts any wood, plastic, fibre or wood substitute **faster** and **cleaner.**

TRY THIS NEW BLADE

You'll never go back to ordinary saws. Buy through your distributor . . . or write for Bulletin "WW" which gives complete information.

Regular Wood Band Saws Also Available



Made By The World's Greatest Toolmakers

THE L. S. STARRETT COMPANY
ATHOL, MASSACHUSETTS

nel. **Elmer R. Graebner,** former Chicago division manager, has been appointed industrial sales manager. **Donald J. Moore,** formerly northwestern division manager, replaces Graebner, and **William J. Hoy** succeeds Moore.

One of the nation's leading atomic scientists, **Dr. Charles Allen Thomas,** has been elected president of Monsanto Chemical Company. The 51-year-old scientist replaces William M. Randy who retires.

Thomas A. Willson, Jr., has been elected vice president of Willson Products, Inc. Mr. Willson will also continue with his duties as assistant secretary of the corporation.

T. A. Willson, Jr.

Del D. Harader

Boice-Crane Co., 930 W. Central Ave., Toledo, Ohio, have appointed **Del D. Harader** as their factory representative in Oregon, Washington and northern Idaho. Mr. Harader takes over the territory served for 15 years by Herman E. Fricke. Mr. Fricke is retiring from the power tool field.

DeWalt, Inc., Lancaster, Pennsylvania manufacturer of radial arm saws, announces the appointment of **Ernest Lux** to supervise DeWalt sales in western Pennsylvania and West Virginia. **James** Carpenter is the new district manager for Maine, New Hampshire, Vermont, Massachusetts and Rhode Island.

Executive Vice President **Fred M. Gilles** was elected to the board of directors of Acme Steel Company. Works Manager **William C. Fork** was elected vice president at the board meeting. The remaining twelve directors were re-elected.

ALL COLOR WOOD

A new company, called the U.S. All Color Wood, Inc., has been established for the purpose of merchandising a unique, recently-perfected process of impregnating wood with a variety of standard colors. The formula is one in which the plywood or veneer itself is permeated completely with the color. Then the layers are laminated to form the finished substance out of which hundreds of consumer items can be made.

The all-color wood can be utilized for many articles now known in the consumer field and also has great potentialities for new items. Some uses include: fashion accessories, jewelry, kitchen and general home furnishings, salad bowls, wall paneling, cigarette boxes, etc.

Complete information is available from the Company at 280 Madison Ave., New York City.

S. DUNCAN BLACK

S. Duncan Black, president of the Black & Decker Mfg. Co., manufacturers of portable electric tools, died suddenly on April 15th in Baltimore, Md. Co-founder of the firm with Alonzo G. Decker 40 years ago, Mr. Black had continued as the active head of the company until his death. He was 67 years old.

S. Duncan Black

Mr. Black saw the company grow from the sale of a $600 "horseless buggy" to combine with an equal cash investment by Mr. Decker to one of the largest manufacturers of portable electric tools.

URAC "185"

The Perfect Bonding Agent for Decorative Laminates

EASY TO MIX - EASY TO USE

The properties of Urac Resin Adhesive 185, a development of modern Chemistry, make it the most efficient adhesive for Gluing Decorative Plastic Laminates to Bars, Table Tops, Soda Fountains, Sink Tops. Make your GOOD JOBS * BETTER * by using this remarkable Adhesive

AIR DRY - FORCED DRY

Water Resistant
Stainproof
Rotproof
Low Pressure
Non-crazing

IDEAL FOR R.F. OR H.F.

Designed especially for assembly work. Its low pressure and anti-crazing properties make it ideal for gluing wood where inadequate pressure or irregular surfaces make it impossible to insure close fitting joints. Use for furniture, Toys, Boats, Millwork, Laminating or wherever a joint stronger than wood is desired.

Now available in small containers

Pints, quarts, gallons, fives shipped from Iron Mountain, Michigan or nearest branch. Branches at 109 Water St., New Haven, Conn., P.O. Box 8, Station D, Dayton 10, Ohio—1103 W. Marietta St. N.W., Atlanta, Ga.—760 Aloha Street, Seattle 9, Washington—705 Cullen Blvd., Houston 3, Texas—5928 So. Garfield Ave., Los Angeles 22, Calif. Write today for prices and free bulletins.

THE NELSON COMPANY
IRON MOUNTAIN . MICHIGAN

A LOW PRICE for a SOLID SPLICE

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SARANAC

CORRUGATED FASTENER DRIVER

You'll find this Saranac a versatile, hard-working machine for making low-cost splices. Here's why: It'll drive fasteners into the hardest woods, because driver supports fasteners to the last thousandth as they're driven. It'll join a hard board to a soft board. And it'll even anchor loose knots.

This costs less to do on a Saranac, which uses standard coil-wound fastener stock. You can adjust head to cut and drive fasteners from 4 to 8 corrugations long —from ¼" to ¾" wide—plain or saw edge—to flush position or imbedded into board. For versatile, low-cost splicing investigate Saranac's Corrugated Fastener Driver.

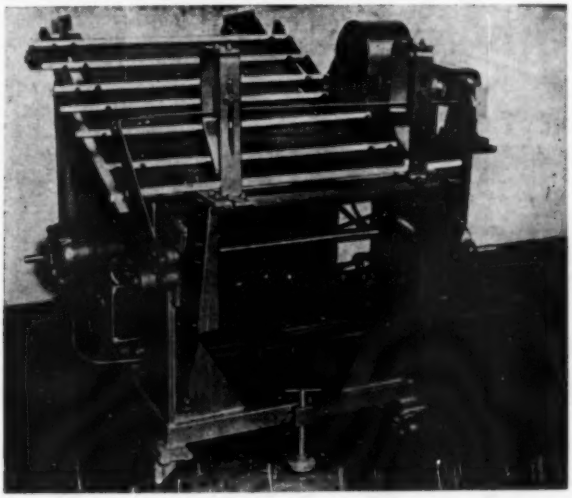
SARANAC MACHINE CO.

BENTON HARBOR, MICHIGAN

Manufacturers of the World's Largest Line of Fastening Machinery

Equipment and Supplies for the WOOD WORKING INDUSTRY

NEW HAWKER AUTOMATIC DOWEL CHUCKING MACHINE



Shown in production operation for the first time at the 1951 Forest Products Research Society Industry Show, the new Hawker Model T-50 fully automatic dowel chucking machine(patents pending) is the latest addition to the Hawker Manufacturing Company's line of precision machine tools for woodworking.

The Model T-50 chucking machine is completely automatic in operation. A variable speed motor gives flexibility of feed speed up to 1500 dowels per hour. A separate, constant speed 3600 rpm motor drives the tool head, which can be changed to perform drilling, tenoning, tapering, threading, topping or a variety of other functions according to the tool used.

The chucking machine is caster

STOP DUST

DUSTKOPS — **20 Models**

UNIT TYPE — 300 to 3600 cfm
LOW COST — ¼ hp to 3 hp

AVAILABLE FROM STOCK

For: Grinders, buffers, polishers, woodworking, lint . . . All Dusts.

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for cutting • shaping • drilling • finishing

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mounted with screw dogs to hold it in position to receive dowels from the rod and dowel machine. Dowels are delivered into an aligning magazine from where they are selected one-at-a-time by elevator arms and dropped into a toggle clamp and held for the desired end work. After the work operation is completed the elevator arms deliver the completed piece out of the rear of the machine into boxes or wheeled racks.

Additional information from Hawker Mfg. Co., Dept. WD, 1425 Keowee St., Dayton, Ohio.

TENKO DOUBLE-END TENONER

The Woodworking Precision Machinery and Tool Co., Inc., is introducing the Tenko double-end tenoning machine. The machine is manufactured by Albert Koberle Machine Ltd. in Switzerland. The Tenko keeps the working piece fixed by an air clamp and two moving heads pass by the fixed piece, cutting grooves, tenons, etc. Precision up to .009 inches is achieved by this method of operation, it is claimed.

The Tenko is operated by one man. It occupies a space approximately 5'x14' as there is no off-loading. It uses two 5 hp and two 3 hp motors. The moving units can work parallel to one another, says the manufacturer, or they can be placed at an angle to each other thereby presenting many interesting types of joints. Miter cuts with grooves and ten-

"HARTFORD" CLAMPS

Style 6G: Deep engagement clamps. Quick acting. Take the place of "C" clamps. Speedily adjusted.

Style 5: For interior woodworking, body building, furniture, sash and door manufacture. Rigid action tail piece. Quickly adjusted.

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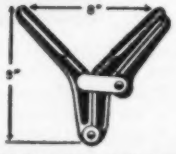

No. 62 Miter; Planed off jaws with hardened steel pins just long enough to hold work.

The HARTFORD CLAMP COMPANY EAST HARTFORD, CONN. Est. 1915

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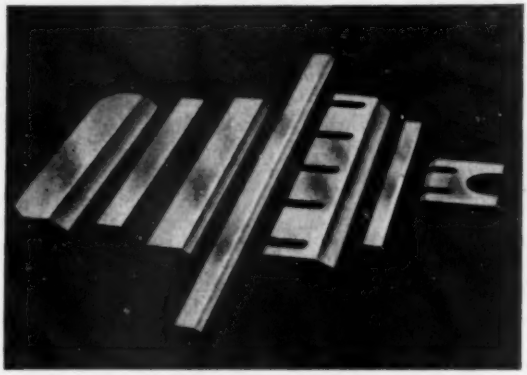

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HIGH SPEED STEEL

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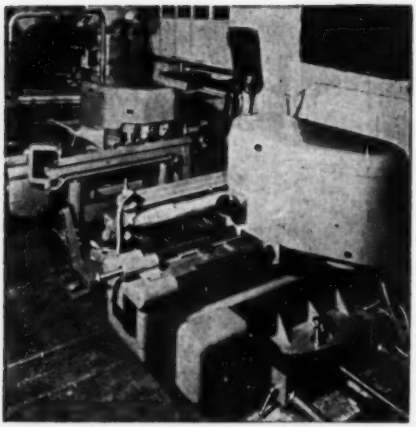

ons can be made in one operation. The moving units operate along cams which enable interlocking grooves and tenons to be made.

Information and literature may be obtained by writing to Woodworking Precision Machine and Tool Co., 224 Fifth Ave., New York City.

PUMPS FOR FINISHING MATERIALS

A new line of air-operated material handling pumps is announced by the Binks Mfg. Co., makers of spray finishing equipment. These pumps are especially designed for use with spray or flow guns including those used for fine finishing work. These versatile pumps handle all materials from thinners, enamels, lacquers, paints and adhesives. They can also handle protective coatings of every kind, even those containing abrasives.

These pumps operate directly from original shipping containers, saving the user handling time. The pumps are available in five pressure ratios ranging from 1:1 for handling light materials to 10:1 for heavy, semi-fluid materials or those which must be pumped through long hose or pipe lines. Recommendations as to the best pressure ratio and nozzle setup will be made by the Company engineers.

Full information from the Binks Mfg. Co., 3122 Carroll Ave., Chicago.

For MORE HOLES *between Sharpenings*

LOOK FOR THIS NAME

RUSSELL JENNINGS

ON THE BITS YOU USE

● The special tool steel, made to Russell Jennings' own analysis, gives these bits LONGER EDGE LIFE. For you that means more holes between sharpenings.

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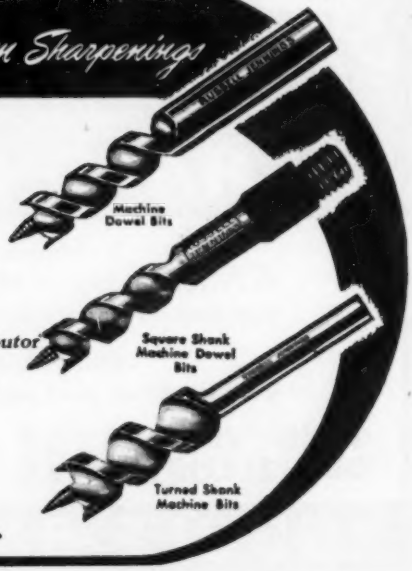
THE TOOL BOX OF THE WORLD

Stanley Tools, 119 Elm St., New Britain Conn.



MORE SPEED MORE SUPPORT

MORE WORK

PADDOCK BALL-BEARING BAND-SAW GUIDES

IMMEDIATE DELIVERY—WRITE TODAY!

For faster band-saw production—greater safety to operators—cutting down saw-blade breakage, install PADDOCK BALL-BEARING BAND-SAW GUIDES. Thousands now in use in every type of industry. Ball-Bearing wheels (inter-changeable) running with the blade give strong, friction-free support and in effect hold working portion of blade as if in a frame. Very reasonably priced! Can be used on old or new band-saws for greater economy and faster production. Write for circular and price.

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BAND SAW GUIDES

I Can Help You To

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Learn At Home In Your Spare Time

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I've helped a host of ambitious men to attain top positions in the furniture and woodworking industry. I'll help you if you'll just give me the chance. My 81-Lesson Home Study Course or my Resident Course at Grand Rapids is highly personal and teaches you the arts of Sketching—Drafting—Rod Making — Time Study — Cost and Production Scheduling. Free G.I. instruction. Money back trial offer to non-veterans. Get the complete facts—then judge!

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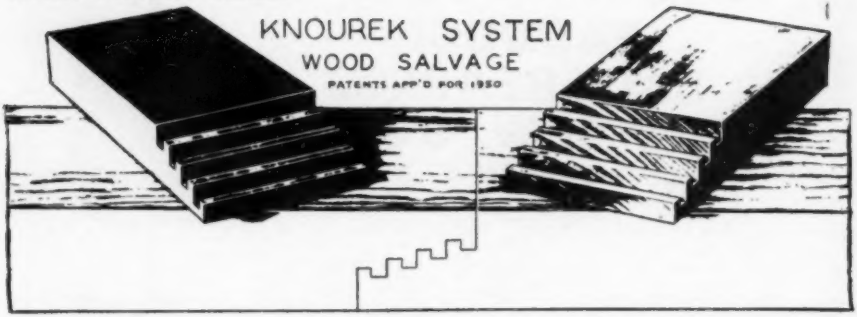
SHORT PIECES UTILIZED



The enormous waste of lumber in the woodworking industry prompted Woodworkers Tool Works, 220 S. Jefferson St., Chicago, Ill., to design this pyramid joint. By this development short pieces are going into use instead of into the furnace.

By a simple operation, short pieces are joined together resulting in a strong durable board. The Knourek system is recommended for many furniture and wood parts where full strength of solid lumber is relatively unimportant. The pyramid joint represents strength, having no tendency to warp or wind. The greatest merit of the pyramid joint is its self-aligning properties which facilitate gluing.

The cutter head trims ends and cuts grooves in one operation; two ends are cut at the same time. The machine is used for building up short ends into

14,000 sanding strokes per min. with SAND-O-FLEX

—Compare this speed with hand sanding!

Each Sand-O-Flex sanding wheel contains 8 abrasive strips backed up by 8 separate brushes. When rotated at usual motor speed, you get 14,000 sanding strokes per minute! Not only does Sand-O-Flex sand faster — it gets in and around intricate shapes that were formerly sanded by hand. Garnet cloth abrasive strips unreel when worn. Replacement cartridges in many grits available at low cost. Fits your present power tools, 4 sizes. See your dealer or write for literature.

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DETROIT HANDY "TAC" RAG

DETRO MFG. & SALES CO., INC., CULVER CITY, CALIF.

usable pieces and the best results are obtained when using surfaced lumber. However, rough lumber of the same thickness may be joined.

This system will be of special interest to users of popular or premium species of lumber at this time of shortages and high prices. The machine is now in the process of design. It will have a roller table on which one or more pieces may be placed and pyramid joints cut, ends trimmed in one operation.

After gluing, the fine surface line may be filled with wood putty or filler in a color matching the wood. The machine will soon be in operation. Woodworkers Tool Works invites those interested to send pieces of lumber which they will fabricate and return for approval.

HOT-R-COLD LACQUER

The V. J. Dolan Company, 1830 N. Laramie Ave., Chicago, is announcing their new product, "Hot-R-Cold" lacquer. This may be sprayed hot or cold without thinning. We are told that the material will produce a smooth heavy-bodied film with good cold check resistance regardless of which method of application is used.

ESSENTIAL MACHINES FOR AIRCRAFT PRODUCTION

With the renewal of military aircraft production in the United States, Ekstrom, Carlson & Co., 1400 Railroad Avenue, Rockford, Illinois, manufacturers of high speed routers for the woodworking industry, is again (as during World War II) offering their No. V-84 and No. V-109 radial arm router-drills for working in plywood, plastic or non-ferrous metals.

There are five standard types available in each of the two sizes (V-84 and V-109) and are as follows: combination radial arm router-drill (Type C-2) fit-

SLASH TOOL COSTS—SPEED PRODUCTION

With VELEPEC Carbide - Tipped Router Bits, Grooving Saws, Shaper Knives, Four Wing Shaper Cutters, etc. for every conceivable shape. Stay sharp 10 to 30 times longer than regular steel tools. They stay sharper, cut cleaner and faster with smoother finishes. Effect tremendous savings in machine "reset" time and sanding operations.

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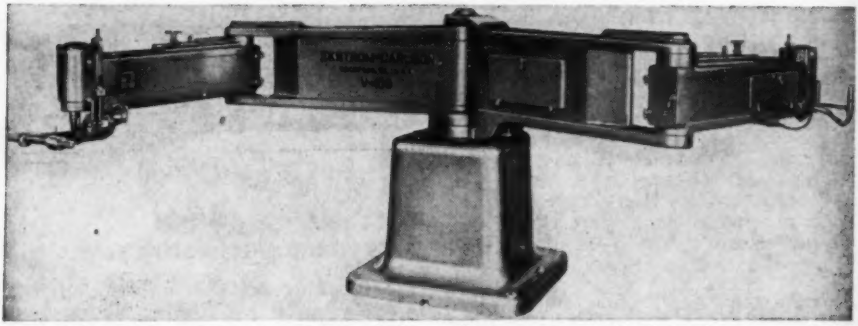
Send Us Your Requirements For Quotation

FRED M. VELEPEC CO.

71-11 64th Street BROOKLYN 27, N.Y.



ted with one router head and one drill head; double radial arm router (Type R-2) employing two router heads; double radial arm drill (Type D-2) equipped with two drill heads; single radial arm router (Type R-1) with only one router head; and the single radial arm drill (Type D-1) furnished with one drill head.

With a radial reach of 109", the No. V-109 will cover all points of two 4' x 12' work tables (set up 180° apart, one on each side of the machine) upon which work stacked in sheets up to a ¾" total thickness may be routed or drilled simultaneously. Similarly, the No. V-84, with a radial reach of 84", will take care of work within the dimensions of a 4' x 6' work table. All models have a full 360° swing around the turret mounting post.

The 5 horsepower router head spindle rotates at a speed of 15,000 RPM, while the dual-speed drill head motor delivers spindle speeds of 7,500 and 15,000 RPM

Nutting LUMBER BUGGY

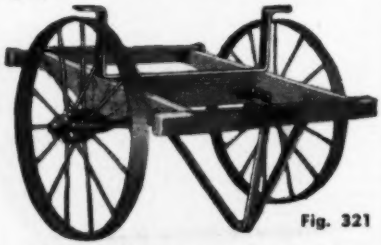


Fig. 321

Handles Heavy Loads on Unpaved Yards

With its large diameter wheels and wide tires, Fig. 321 Lumber Buggy provides good traction for heavy loads in unpaved as well as paved yards. Roller bearing wheels for easiest handling. Heavy oak frame, reinforced corners. Two sizes. Nutting makes all types of woodworking trucks — ask for Bulletin 47-W.

Nutting Truck & Caster Co.
1124 Division St. Faribault, Minn.

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CLEANS - FAST - SAFE AND AT LESS COST!

Cleans motors, planers, all machines fast. Prevents over heating and reduces fire hazards. Four handy models operate from any socket. Write for details and

ACE
Portable Electric BLOWER

Write for details

THE ACE CO.
122 W. Washington St. Ocala, Fla.

at 1 and ½ horsepower, respectively. Both motors are high frequency, totally enclosed, fan-cooled and equipped with precision ball bearings. Statically and dynamically balanced, they insure smooth cutting and vibrationless operation.

Other refinements include: positive adjustable stops and spindle brakes for both heads; operating controls built into the conveniently located handles; eight-point coolant spray surrounding the pattern follower and routing tool, complete with shut-off cocks and needle valve adjustments for correctly metering the amount of air or coolant; combination drill bushing and hole finder for the drill head; and forced type lubrication for the bearings of both heads.

This company also manufactures a complete line of routing tools for use with the machine.

Descriptive literature, together with prices and delivery, will be sent upon request. Address all inquiries to: Ekstrom, Carlson & Co., 1400 Railroad Avenue, Dept. W-9, Rockford, Illinois.

PEPPY PEELER

During recent months the Sandy Hill Iron & Brass Works of Hudson Falls, N.Y. has undertaken to redesign and manufacture the "Peppy Peeler" which was originally developed in Ontario, Canada. The new machine, which is to be marketed in the United States, may prove to have application as a portable or semi-portable debarker for the pulpwood industry.

The Sandy Hill Peppy Peeler is intended to be sufficienty portable for use in the woods. Its overall weight with engine is approximately 2,200 lbs. and its relatively compact size can be judged by the accompanying photograph. It is suitable for skid or wheel mounting, and the manufacturer states that a powered cable drum or niggerhead could be added to facilitate mov-

Supreme BAND SAWS

END YOUR TROUBLES

SUPREME BAND SAWS cut faster . . . have increased cutting capacity with minimum breakage! Present day high speed equipment demands Supreme Saws. Free from kinks and imperfections. Made from the finest Special Nickel Alloy Steels, tempered for toughness . . . to stay sharp! There is a Supreme Band Saw for every industry . . . for every material. Special purpose saws are made to order.

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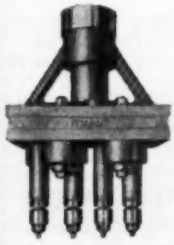
THE SAW & KNIFE SPECIALTY CO., INC.
6526 CARNEGIE AVENUE • CLEVELAND 3, OHIO

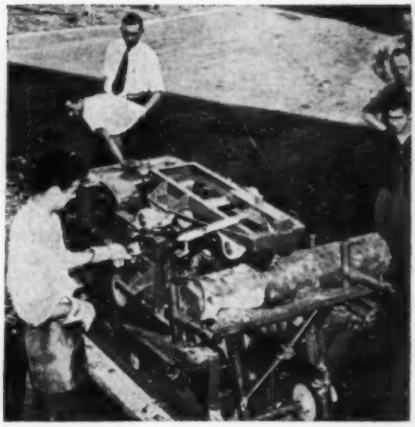


MULTIPLE SPINDLE DRILL HEADS
ADJUSTABLE TO STRAIGHT LINE AND RADIAL PATTERNS
FIXED HEADS TO SPECIFICATIONS LITERATURE ON REQUEST
NOBLE MACHINE TOOL CO. 195 Weeden St., Pawtucket, R.I.

ing the unit short distances where maintaining a horse or tractor on the job for this purpose would not be practical.

The debarker is of the rosser type, having cutting blades, or knives, set in a rotating cylindrical head. The depth to which these knives will cut into the bark on a rough bolt is determined by their adjustment when clamped in place in the head. This cutting depth is controlled by freely rotating steel discs at both ends of the cutter head which come in contact with the wood as it is rotated against the rossing knives. A second series of smaller knives are set in the cutter head on its in-feed side, and are so positioned that they cut off protruding knots as a bolt is fed towards the barking knives.

While being fed through the debarker, a bolt of wood is supported at the rear by the rotating cutter head and in front by a powered worm roll. The cutter head is in a fixed position in the base of the machine, but the worm roll is mounted in a frame which is pivoted



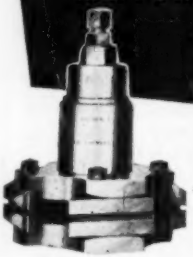
at its base so that it can swing forward and backward to accommodate bolts of various size.

The machine is designed to handle bolts of 3 inches to 20 inches in diameter and 4 feet to 8 feet in length. The debarking of longer material is subject only to such practical limitations as: the

SHIMER HEADS GIVE YOU TOP PRODUCTION ... clean, accurate, fast cutting!

THE SHIMER HIGH-SPEED VISE GRIP MATCHER HEAD

cuts across the entire width of the pattern!



AVAILABLE IN FOUR OR SIX-BIT MODELS with milled-to-pattern bits for high-speed matching, jointing and shiplap production!

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Right Moisture Meter

For Rapidly Testing Wood And Veneer By The Most Reliable Method Yet Devised

Most accurate and versatile meter made.
INSTANTLY INTERCHANGEABLE ELECTRODES, BOTH POINT AND SURFACE TYPES

Wood in all shapes, sizes; smooth, rough; flat, curved; thinnest veneer and heavy timbers — all tested with same meter.
Moisture gradients quickly detected and determined without cutting.
Species correction usually negligible regardless of density.
Available in very wide ranges, from below 3% to above 120% moisture.
Small, light, simple, battery-operated.

Write for catalogue 355FP

KAYDEL MOISTURE GAUGES
Suite 208-210 No. 126 Liberty St.
New York 6, N. Y., U. S. A.

ability of the crew and machine to withstand the handling of excessive weight; the need for supporting the free end of the log before and after passing through the machine; and, the tendancy for sweeps and surface irregularities in the longer wood to cause more pronounced whipping and binding.

Complete information from Sandy Hill Iron and Brass Works, Dept. WD, Hudson Falls, N.Y.

TANNEWITZ AUTOMATIC GUAGE
For Swing Saws
SAVES $30 to $50 A MONTH IN LUMBER AND LABOR
30 Days Free Trial
ORDER NOW OR SEND FOR CIRCULAR
TANNEWITZ WORKS

GUIDE-LINE LIGHT

Carter guide-line lights cast a definite shadow-line upon the material to be sawed or processed, showing the exact path of the saw or area for use before the proposed cut is made. The manufacturer tells us that sawyers speed production of accurate cuttings, well selected to avoid flaw-scrap and spoilage with use of these lights.

The lights are extensively used on rip saws, double-end tenoners and wherever straight line sawing is to be done. The light is used for guide lines for veneer panel setup tables, veneer trimmers and many other shop applications. A tilting type of bracket increases the number of applications and uses.

We are told that manufacturers of showcases, furniture, caskets, boats, plywood, boxes, general lumber and millwork plants are using the lights successfully.

The lights are 18" high, 9¼" wide,

Better-Built Trucks by TOWSLEY

give better service, last longer, cost less in the long run.

TOWSLEY TRUCKS, INC.
1760 Elmore St. Cincinnati 23, O.

SAVE MONEY ON SANDING OPERATIONS

by using our GRAPHITE COATED CANVAS. This acts as a lubricant, reducing friction against back of sanding belts, increasing their life and speeding up operations. Used on endless belt, edge, chairback sanders and handblocks. $6.50 per yard 35½" width, $1.20 per yard 6" wide, f.o.b. Chicago. Other widths proportionate cost. **Export shipments 10% additional. EXTRA HEAVY Graphite Coated BELTING available at $10.75 per yard, in 36" width.**

PROCESS ENGINEERING CORP. **1748 West Fulton Street Chicago 12, Illinois**

36¼" long and weigh about 60 lbs. The lamps are available in sizes for 750w and 1000w. Additional information is available from the Carter Products Co., Dept. WD, Grand Rapids, Michigan.

SMALL AIR CYLINDER

A 1⅛" bore, 1" stroke, single-acting, spring return small air cylinder has been added to the line of "Controlled-Air-Power" devices manufactured by The Bellows Company, 222 W. Market St., Akron 9, Ohio. The new unit was developed primarily for use in jig and fixture operations and for parts positioning and ejection.

Trade-named the Han-D-Air cylinder, it has a power factor of 1:1, developing a thrust approximately equal to the applied air pressure.

Compact in design (4½" long by 1½" high by 1½" wide) the cylinder can be mounted in practically any position: front flange, rear flange, side, foot, or front pivot. The 5/16" diameter piston rod has ½" of threaded end to simplify installation.

While simple in design, construction is unusually sturdy: heavy gauge pump finish brass cylinder, ⅝" thick aluminum alloy heads, oil resistant piston cup, and heavy tension-tested spring.

Probably never before has the American dollar had such goodbying power.
— **Productioneer**

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Testing glued wood products to meet the requirements of industry and Government specifications for strength and moisture resistance is one of the many laboratory services we perform for small and large firms.

Our modern testing facilities and experienced wood technicians can help you on both civilian and Defense products.

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THE MILLIKEN NAILING MACHINE
1. Replaces hand work in assembly
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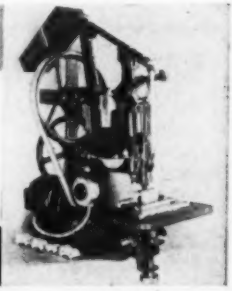
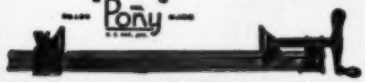
730 Boylston St., Boston 16, Mass.

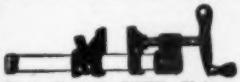


"Jorgensen" CLAMPS

"Pony"



Style No. 70 "JORGENSEN" I-bar Clamps for greatest strength fast operation, and economy.



Style No. 30 PONY Fixtures make ideal bar clamps on black pipe — any length.

"JORGENSEN" "C" clamps are built to take hard service, at low cost.

Genuine "JORGENSEN" Handscrews — hard maple jaws, steel spindles. You can depend on them.

ADJUSTABLE CLAMP COMPANY

"The Clamp Folks"

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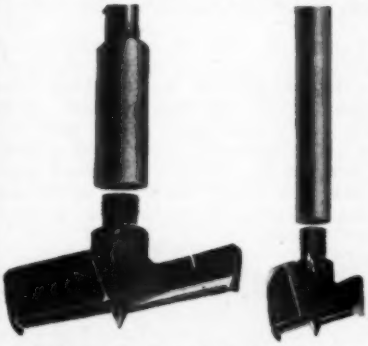
PLANETOR CHIP FLOW MACHINE BITS

Supreme in smoothness, speed, endurance



STOCK SIZES: 1" to 4" by 16ths. 4⅛" to 6" by 8ths on special order.

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A Dependable, Inexpensive Addition to Your Material Handling Equipment.

LIFT TRUCK JACK & PLATFORM

The lowest price combination available in semi-mobile factory or shop handling equipment. You can't beat it for semi-heavy work or convenience. Equipped with steel or rubber wheels.

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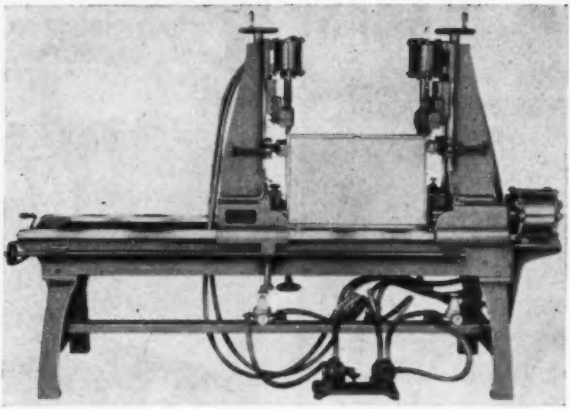
GLOBE VISE & TRUCK CO.

203-07 Front Ave. N.W.

Grand Rapids 4, Michigan

DRAWER CLAMPING MACHINE



The Lancaster No. 230 air-operated drawer clamping machine, with overhead pressure, is new in drawer clamping equipment. A great number of furniture manufacturers machine their drawer sides with a male dovetail on the front end of the side and a female dovetail on the back end of the side. Much of this had to be done by hand, we are told. This new machine will do the job quickly, it is claimed, and will result in a perfectly square drawer with dovetails pressed level.

The time saving element comes as the result of the type of drawer produced. In making a square drawer with level dovetails, saving is claimed on sanding time and on sandpaper, in addition many hours of case fitting time.

The main jaw of the machine is moved with fast lead screws which are the full length of the machine. The manufacturers of this drawer clamp have completely done away with the use of a wrench for any adjustment which may be needed in the day's operations. The adjustments are made and locked by use of notched and knurled hand wheels.

This is a new machine and has not been out long enough to have very many users. Complete information is available from J. M. Lancaster, Inc., Dept. WD, P.O. Box 962, High Point, N.C.

POWER SCREWDRIVERS

The Detroit Power Screwdriver Company has available several models of

screwdriving machines. These vary from a small sturdy machine driving screws from No. 2 x ⅛ to No. 6 x ¾ to larger machines for heavy production.

Their engineering department is also able to design equipment for individual production problems.

The Company describes their machines as follows: "Screws are automatically fed into the patented barrel-type hopper and are always in sight of the operator as they slide down the track. They are escaped one at a time at each stroke of the spindle to the gripping fingers. The screw is still in view as it is held in the fingers and acts as a pointer in locating the hole in the assembly."

If you are interested in simplifying your operations with screwdriving machinery, write the Company at 2828 W. Fort St., Detroit, Mich.

POLISHING HEAD

A new portable brush-backed polishing head has been developed by the Vonnegut Moulder Corporation, Indianapolis, Indiana, makers of the Marschke line of grinding and buffing machines and the Vonnegut 32-brush polishing head.

The portable head consists of two principal parts: an outer shell or drum, holding sixteen replaceable brushes, and a center spool on which are coiled sixteen strips of abrasive cloth. In operation, the brush bristles force the abrasive tips into depressions and also allow them to ride over projections of the

-Hamilton-
FACTORY TRUCKS

Heavy Duty Wheels and Casters

Standard sizes 24" x 48"—30" x 48"—30" x 60". Special sizes and styles to order—capacities up to 7500 lbs.

Write for descriptive circular and low prices.

THE HAMILTON CASTER & MFG. CO.
1800 Dixie Highway Hamilton, Ohio

IMPROVED Ball Bearing Shaper Collars

Friction between collar and pattern entirely eliminated — no more burning.

Outer rim is independent of the slotted collar and revolves with the feed of the work.

Collars can also be supplied without grooves for use with solid steel cutters.

Give diameter of collar and size of hole.

GUSTAFSON & SCOTT MFG. CO.
1637 Lowell Avenue Chicago 39, Illinois

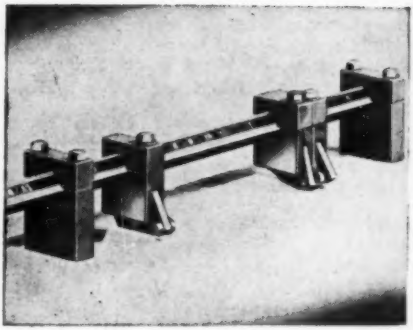
work-piece surfaces. This ability to follow irregular surfaces instead of reshaping them, makes the head ideal for finishing operations on all classes of shaped surfaces, it is claimed

Since an entirely different set of results may be obtained with the same head, simply by changing the grade of grit of abrasive strips used, its applications are broad. The more common uses are: sanding wood, plastics, ceramics, leather; sanding stain, primer and filler coats; removing bubbles and other defects from paint and enamel finish coats; feathering-out operations, removing rust, scale and for other clean-up operations.

Made in 4" and 2" widths, the 4" width (for 4" abrasive) weighs less than 6 pounds when fully loaded. The 2" nominal width head (for 2" wide abrasive strips) weighs less than 4 pounds with a full load of abrasive, and is designed for use with portable hand tools or on a flexible shaft.

STOP GAUGES

The Irvington No. 15 Accura gauge, a recent development of Irvington Machine Works, Portland, Oregon, is a lumber stop designed for use with all types of cut-off saws in cut-up plants, furniture factories, sash and door factories, planing mills, specialty wood working plants, and all types of plants where fast, continuous and accurate cutting is required.



All parts of this steel stop gauge are machined. The accurately broached and slotted square hole permits positive clamping against all four faces of the bar. Since no set screw is employed for clamping, no burrs are produced on the bar. The set screw located in the face of the swinging stop lever provides a micrometer adjustment for any measurement desired. By removal of the set screw on adjacent stop, then extending set screw of original unit to the lever face of adjacent gauge, accurate cuts may be made as close as ⅜" apart.

Further detailed information on the Irvington No. 15 Accura gauge may be obtained by writing to Irvington Machine Works. 1808 N. E. 7th Avenue, Portland 12, Oregon.

Responsibility is written above the door to success **Crosby Clipper**

"Tool Up With Woodworkers"

DOES YOUR MORTISE EQUIPMENT MAKE A CLEAN, STRAIGHT CUT LIKE THIS?

BEARING TROUBLE?

Try the special lubricated Renold bars. Cut your bearing trouble to a minimum. Use Renold guide bars and mortise chains. A wide range of sizes to choose from. One of the world's finest lines of mortise cutting equipment, used all over the world. Many sizes in stock for immediate delivery.

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220 South Jefferson St. Chicago 6, Ill.

Wood Working DIGEST

buyers' service

AVAILABLE WITHOUT CHARGE TO OUR READERS

If you will list below the wood-working machines, supplies or machine shop equipment in which you are interested and mail this page to us, we shall be glad to refer your needs to the manufacturers or others in position to serve you. Replies will come from them — not from us.

If you have any special shop problems let us have the details. Often we can make helpful suggestions.

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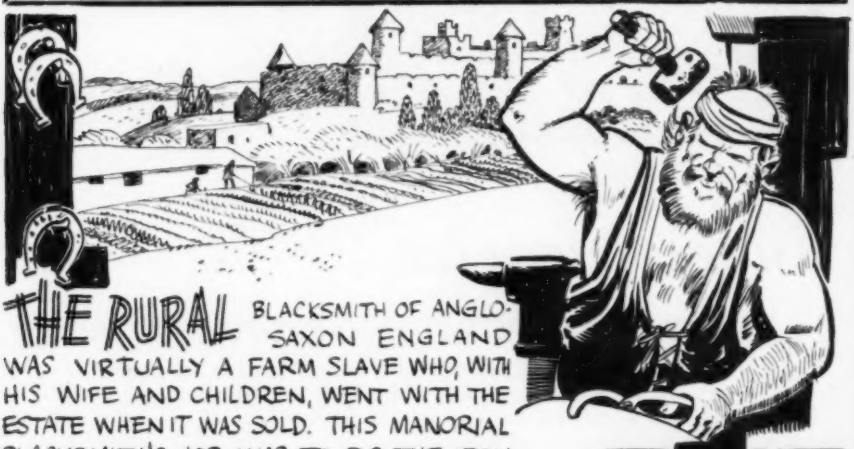
Mechanics Through The Ages



THE RURAL BLACKSMITH OF ANGLO-SAXON ENGLAND WAS VIRTUALLY A FARM SLAVE WHO, WITH HIS WIFE AND CHILDREN, WENT WITH THE ESTATE WHEN IT WAS SOLD. THIS MANORIAL BLACKSMITH'S JOB WAS TO DO THE IRON WORK ON PLOWS, CARTS AND MILLS – AND TO MAKE FISH HOOKS, HANDLES AND AWLS.

AT LEAST SIX BRITONS CLAIMED TO HAVE INVENTED THE PLANING MACHINE. THEY WERE: FOX OF DERBY, ROBERTS OF MANCHESTER, MATTHEW MURRAY OF LEEDS, SPRING OF ABERDEEN, AND CLEMENT AND RENNIE OF LONDON.

TO DETERMINE WHETHER THEIR STONES WERE LEVEL, THE PIONEER PRINTERS OF THE 15½ CENTURY SIMPLY POURED WATER ON THE SURFACE AND WATCHED TO SEE WHETHER IT HAD A "PROPENSITUDE" FOR ONE SIDE MORE THAN THE OTHER. APPARENTLY THEY DID NOT THINK TO USE EITHER SPIRIT-LEVEL OR STRAIGHT EDGE.

They all use...

Moak Single Spindle Shapers and Speedikut Cutters

TO MAKE FAST-SELLING SHAPED WOOD PRODUCTS

What a combination!

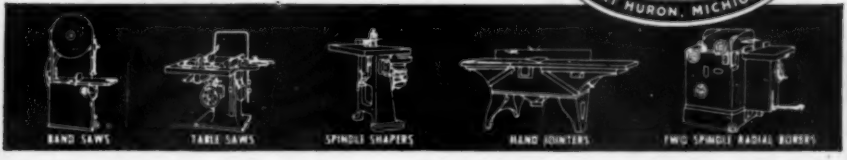
***Moak Single Spindle Shapers*—with speeds up to 12,000 rpm, precision ground table, simple adjustments.**

***Moak Speedikut Cutters*—precision ground from hardened 18-4-1 high speed steel, undercut to maintain original balance when re-ground, and true form relieved.**

Together, they produce rapidly and at low cost the various shapes for furniture, moldings, copings, cabinet-work, sash and paneling that add smart finishing to woodwork.

***Get the facts* on Moak Shapers and Speedikut Cutters. Write for colorful illustrated booklets today.**

MOAK MACHINE & TOOL CO.
MOAK
PORT HURON, MICHIGAN



THE MARKET PLACE

FOR SERVICE
FOR EMPLOYMENT
FOR USED AND REBUILT EQUIPMENT

Rates for Classified Advertisements

Lists of Used and Rebuilt Machinery, either For Sale, Wanted, or For Exchange, set in uniform style, will be published in the Classified Section at the rate of $7.00 for name and address and a five line advertisement. For additional lines, only 70c per line.

DISPLAY ADVERTISEMENTS: 1 inch (Minimum), $8.00; 2 inches $16.00; 3 inches (Maximum), $23.00.

Write directly to those offering the machine for sale, for prices and full descriptions. If what you seek is not advertised, write Hitchcock Publishing Company, 222 E. Willow Ave., Wheaton, Ill., making known your wants on either new or used machinery and the publisher will gladly assist you.

FOR SALE

STANDARD of COMPARISON
THE "HART" LINE

Largest stock of used machinery in America, many ball-bearing, motorized. Substantial savings. Prompt shipment. Write for our list. We equip plants completely. We also buy complete plants or individual machines.

Earle Hart Woodworking Machine Co.
565 W. Washington Blvd., Chicago 6, Ill.
Phone RAndolph 6-4970

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Band saw, 36" Crescent ball bearing Carter disc wheels, 3 HP direct motor drive
Glue Cooker, Black 8-gal. electric
Glue jointer, Jenkins No. 3CDA motorized
Lathe, 36" Imperial Auto. Turning, M.D.
Planer, 24" H & B double, adjustable bed, M.D.
Router, Onsrud W-240D, 5 HP two-speed
Sander, 42" Yates No. 401 3-dr. roll feed
Sawing, boring and chucking machine, Bell No. 24 Auto. double end.
Woodworker, Sidney Universal, five machines.

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S. W. Harrington Inc.

P. O. Box 230 Asheville, N. C.

Air Compressors, various sizes
Bandsaw, Amer. 42" pb. bd.
Band saw, New Crescent 20" bb. dmd.
Band saws, Amer. B-36 36" bb. dmd
Band saws, New Moak 36" bb. dmd.
Borers, McKnight No. 88 dmd.
Borer, Amer. 2 spindle radial dmd.
Borer, Root 2 spindle horiz. dmd. style "K"
Boring & sawing, McKnight 26F dmd.
Clamps, Handy No. 71 revolving
Clamps, Wysong & Miles case, air.
Clamp, Taylor, 40 sec. 4 clamps, 7 ft.
Dovetailers, Dodds, 10-15 and 20 spindle
Dowel Driver & Gluer, Bell No. 8 dmd.
Glue jointer, F&E No. 429, bb. dmd.
Glue Jointer, Jenkins No. 343A bb. dmd.
Hog, Mitts & Merrill No. 5 bd.
Jointer, Amer. 12" bb. dmd.
Jointers, New Moak 12", bb. dmd.
Lathe, Yates No. 74 bb. dmd.
Mortiser, Sidney, single spindle pb. bd.
Mortiser, Greenlee No. 228 Vert. bd. & motor
Moulder, Amer. 8" sq. hds. pb. bd. & motor
Moulder, Newman No. 20—8" sq. hds. pb. bd.
Planer-Matcher, Yates A1-15"x6" rd. hds. pb. bd.
Planers, New Crescent 24" bb. dmd.
Resaw, Connell & Dengler Circular pd. bd.
Router, Defiance, 2 spindle bb. dmd.
Routers, Carter, floor type Hvy., duty, electric
Sander, Berlin, 31" 3 drum, roll feed bd.
Sander, Mattison No. 134, pb. bd.
Sander, Mattison No. 138—Belt, hand, pb. & motor
Sander, New Jefferson, hand block, bb. dmd.
Sander, Smith 49" 3 drum endless bed, bd. with motors
Sanders, F & E 60" 3 drum roll feed, dmd.
Sander, Mattison No. 172 edge belt bb. dmd
Sander, B & M 14 flat sander & motor
Sander, 48" double disc, dmd.
Sanders, McKnight sgl. drum 24"x16" dmd.
Sanders, Nash No. 25—10 spdle. dmd.
Saws, Famous, cutoff, bb. dmd.
Saws, Yates-Amer. G-7 straight line rip, bb. dmd.
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Saws, New Delta-Crescent 12" tilt. arbor, dmd.
Saws, Powers, gang rip. pb. v-belt & motor
Saws, Buss Tilt table Variety bb. dmd.
Saws, Yates G5 gang rip, pb. bd.
Shaper, Sherril Sgl. Spdle. bb. dmd.
Shaper, Defiance dbl. spdle., bb. dmd.
Shapers, New Moak single spindle, bb. dmd.
Taping machines, Dennis No. 2
Tenoners, Wilkins-Challoner No. 70, bb. bd. & mtr.
Tenon Heads, single & double end.
Tenoner, Hayes 6 ft. dbl. with copes, pb. bd. & motor
Tenoner, F&E Sgl. with copes and motor pb. bd.
Veneer Jointers, Jenkins Saw—6 ft. bd.
Woodworker, Crescent pb. bd.

Many other items, send your inquiries.

FOR SALE

Clifton Machinery Co.
1023 W. 6th St. Cincinnati, Ohio

Saw Dust and Shavings Mill Exhausters and Blowers—Hundreds in stock, sizes to suit any need. Also Air Compressors, Fans, Rotary Blowers. Money Savers—Send Specifications.

All machines rebuilt and fully guaranteed.

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Woodworking Machinery—new & used
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Moulders, sanders, self-feed rip saws, band rips routers, glue jointers, saw tables, planers, and many other items of new and used machinery.
Send us your inquiry.

FOR SALE

Woodward Machinery Co.
309 E. Second St. Cincinnati 2, Ohio

Band saw, Sidney, 32 in., $185
Borer, Andrews, 20 in., 6 spdle., vertical, $350
Box Nailers, 4 and 6 track, Doig, $550
Clamp, American, 8x4 ft. Door, $250
Mortiser, F&E, No. 379, ver. HC auto. hvy. duty, $400
Mortiser, New light HC, $100
Planer, American, No. 3 30x7 sgl., $375
Ripsaw, Yates, G-2, st. line, self feed, $600
Sander, Boss, 30" two drum, $350
Saw, American, Variety tilt table, $135
Shaper, Delta, sgl. sp. BB MD, $185
Sticker, American, 1 side with P&B att., $250
Sticker and jointer combined, $375
Surfacer, Amer. 30 in., dbl., No. 49, rd. hd., BB, $1600
Tenoner, Egan, sgl. with cope, $250
Wood Worker, 12 in. Surfacer, jointer, band saw and ripsaw, $375

FOR SALE

Morgan 115" - 32 Track, Open Back, Nailer. Motor driven.

BRANYAN & PETERSON, INC.
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FOR SALE

Jenkins Double End Tenoner. Model No. 95. In operation daily. Open for inspection. July delivery.

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All machinery needed to manufacture Wood boxes. Including 5 nailing machines, two self feed rip saws, one box-matcher, one corrugated fastener machine, one two color printer, 3—5 hp swing cut-off saws, and 2—3 hp table saws. All equipment new or re-built and ready to go. Offered as a complete unit subject to prior sale, for immediate delivery.

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McKnight No. 4CM Combination Boring, Sawing & Chucking Machine, 8 motors and feed motor, late type, little used.

Yates No. 415 (Berlin) 30" Two Drum Boxboard Sander

W. D. MATTHEWS MACHINERY CO.
New & Used Woodworking Machinery
279 Center Street
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FOR SALE

1—15"x4" combination Planer Matcher and Resaw fully motorized; variable feed complete with heads. Condition excellent.

QUIRK CRATE & CABINET CO.
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FOR SALE

One Onsrud No. WA-50 Automatic Shaper. Perfect condition. Used very little.

PHILIPP MFG. CO.
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FOR SALE

36" YATES-AMERICAN No. 1 Jointer, ball bearing, four knife round head with guaranteed 10 HP, 3600 rpm, 220/440. Serial No. B10547. Would make excellent facer.

Glue Jointer and Edge Moulder, YATES-AMERICAN No. 213, with two 5 HP, 3600 rpm, ball bearing cutter motors and vise grip heads. 1½ HP, 1800 rpm feed motor. Feed speeds 20/40/55/75 f/m. Jointer bar.

30" MATTISON 55C Automatic Shaping Lathe with guaranteed 10 HP, 1800 rpm, 220/440 motor. V belts, head and complete set of gears. Short feed rod, no center table.

24" AMERICAN Facer Jointer with JACKSON and CHURCH feeder. 5 HP, 3600 rpm arbor. Belted feed by 5 HP, 1800 rpm motor with slide rails. In good operating condition.

120" Beech Double Cutoff and 82 double mitre with two 5 HP, 3600 rpm, ball bearing tilting mandrels. Carriage travel 24".

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ALL MACHINES FOR 220 v., 60 cy., 3 ph.
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Mattison No. 205 Chain Feed Rip Saw, motor driven, V tracks.
Curtis 6 ft. Automatic Stroke Sander.
Yates No. 282—44" Ball Bearing Band Rip and Resaw.
Yates No. 108—15" Moulder.
Root Self Feed Rip Saw.
Defiance Chaplin Automatic Handle Lathe.
Mattison No. 57B—42" Automatic Lathe.
Greenlee No. 225 Hollow Chisel Mortiser.
Fay & Egan No. 2 Single End Tenoner.
Greenlee No. 357 Motor Driven Vert. Borer
Herzog 24" Automatic Jointed Feeder, 4 post type, motor driven.

BABCOCK MACHINERY CO., Inc.
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"Crossroads of the World"
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BRyant 9-6488

Woodworking Machinery For Sale

YATES-AM. No. A20 P & M Top Prof.
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F & E No. 180 Band Rip & Resaw.
H & B No. 110 15" P & M 6 K Ro Hds.
YATES No. 91 9" P & M 8 K Hds. Prof.
YATES No. A4 15" P & M Ro. Hds.
YATES No. C4 8" Moulder Slip Hds.
YATES No. C3 4" Moulder Slip Hds.
YATES No. 108 10" 4 Side Moulder
YATES No. 108 15" 4 Side Moulder
AMERICAN No. 80 30" Dbl. Surfacer

These and others in our warehouse.

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NEW MOTOR DRIVEN MACHINES

Kornau Hollow Mortiser	$ 165
Wallace Hollow Mortiser	450
Yates 20" Band Saw, 3 Phase	483
Yates 16" Band Saw, 1 Phase	328
Powermatic 16" Planer	711
Belsaw 12" Planer, less motor	215
Darra James 12" Tilting Arbor Saw	285
Hutchinson 8" Jointer	465
Powermatic Chain Mortiser	642
DeWalt Saws ½ to 7½ H.P.	
Disc Sander 12", Floor Type	54
Northfield 12" B.B. Jointer	721
Northfield 12" B.B. Jointer, less mtr.	521
Sash Relisher	450
Northfield 36" Band Saw	1390
H & A 12" Swing Saw	375
Powermatic Tenoner	863
Enterprise Pulley Mortiser	585

Woodworkers' Tool Works
220 S. Jefferson St. Chicago 6, Ill.

ROOT Model D horiz. Boring Machine, 6', 4-spindle, BB, MD, 3/60/220/440

OLIVER Pattern Makers Lathe 90"x78" c-c

X L Moldmatcher, 3/60/220/440

COVEL-HANCHETT GK 36 Knife Grinders 3/60/220/440

AMERICAN 12" & 6' Stickers bd.

AMERICAN Timber Cut-off Saw Model 32, 42" blade.

MONARCH Veneer Redrier 6 plates 36"x 72" with Hyd. pump & motor 3/60/220.

Surplus & Salvage Co., Inc.

Jamestown, New York

WOODWORKING MACHINERY

PRIVATE LIQUIDATION SALE

Moulders, rip & cut-off saws, planers, jointers, chain mortiser, tenoner, scarfer, compressor, shapers, routers, facing surfacer, belt sander, radial drill, glue spreader, exhaust fans, electric screwdrivers & misc. equipment.

Can be inspected under power until July 1.

R. J. HAFNER CORPORATION

Smithtown, L.I., N.Y.

FOR SALE

10 ft. Linderman Machine. Factory rebuilt and used only 6 months. Complete with saw and grinder and 3 phase 220/440 60 cycle motors. Can be seen in operation. Perfect for Gov't box contractors.

75 H.P. Corliss Steam Engine. 10 ft. fly wheel, belting, line shaft and pulleys, now in operation.

15" Newman No. 52 Moulder. Plain bearing, good condition, now operating.

TOCCOA CASKET COMPANY

Toccoa, Georgia

REDWOOD

Kiln Dried or Air Dried

Shorts and Shop Grades

Your Inquiries Welcome

KING REDWOOD, INC.

706 F & M Building,

Long Beach 12, California

FOR SALE

Large quantities 3/8" 5 Ply Mahogany faced plywood Cut-outs, mostly size 15¼x11¼ with rounded corners. Also size 16x11⅝ with square corners, and other sizes.

BETHLEHEM WOODCRAFT CO.

BETHLEHEM, PA.

IMMEDIATE DELIVERY

New Delta 20A-30A-40A-50A Ball Bearing Radial Saws
20" Ball Bearing Band Saw
New Millbury Bench Tenoner, M.D.

AAA SAW & TOOL SERVICE AND SUPPLY COMPANY

1401 W. Washington Blvd. Chicago 7, Ill.

FOR SALE

S. A. Woods 12", 15" four-side moulders.
Oscillating bit mortiser, DMD.
Wooden box machinery.

WANTED

No. 315 top and bottom drum single sander
Band resaw.
Printer, 14" drums.

BOSHCO, INC.

200 Boston Ave. Medford 55, Mass.

FOR SALE

Nash No. 10 Sander with shafts and Belting and 5 HP 440 Volt Motor
Yates No. 70 Lathe, together with shafts and Belting and 10 HP 440 Volt Motor. Also 220" Heads and 240 Knife Holders.
Berlin Invincible Roll Feed 49"—3 Drum Sander "V" Belted Individual Motors.
Yates 36" late type Bandsaw

David V. Lundberg

3413 Highcrest Blvd. Rockford, Ill.

Douglas Fir Plywood

For sale, ½" 5-ply Douglas Fir Plywood, Grade A-D, sanded both sides, interior type (free of knots on one side). 182 pieces, 1'x8'; 76 pieces, 1'x10'; 84 pieces, 1'x12'.

ACME TANK & WELDING
1031 New Britain Ave.
West Hartford, Conn.

1—Panel Fin. Taylor 66" x 15 complete with Glue Spreader, Cut Off Saw, and Steam Generator.
1—Glue Reel, Black Bros. 8'6" 40 section, 4—32" Clamps each, electric drive.
1—Newman No. 600 Single Surfacer 24" BB DD with Grinder.
1—Double Surfacer, Whitney 30" BD with motors.
1—Boring Machine, Indiana No. 15-2.
1—Reynolds Screwdriver, power driven, hopper fd.

ROYAL MANUFACTURING CO.
NEWMAN, GA.

HEAVY DUTY GREENLEE 24" BALL BEARING JOINTER. Practically new. Well suited to work in connection with self feeding attachment.
Also jointers from 12" to 30".
More than 150 machines to select from.

The Osborne & Sexton Machinery Co.
COLUMBUS 16, OHIO

AN UNUSUAL ITEM

5,000,000 surplus dowels—2⅞"x1/12". Perhaps you can use them, price reasonable, sell all or part. Happy to send samples.

SUN VALLEY CORP.
819 Tenth St. Oshkosh, Wisconsin

NEW KORNAU HOLLOW CHISEL MORTISER
NEW 12" B.B. TILTING ARBOR SAW
NEW 12" and 20" PARKS B.B. PLANER
NEW No. 5 H and A M.D. SWING SAW
No. 24B BELL DOUBLE END, SAWING, CHUCKING AND BORING MACHINE, M.D., 220 VOLT, 3-60, COMPLETE WITH ACCESSORIES.

AAA SAW & TOOL SERVICE AND SUPPLY COMPANY
1401 W. Washington Blvd. Chicago 7, Ill.

Motor Driven
FREQUENCY CHANGERS
IN
STOCK

Sizes: 10 to 60 KW
Outputs: 90-100-120 and 180 cycle
Reliably Rebuilt
1 YEAR GUARANTEE
Attractively Priced
SAVE MONEY when you BUY any ELECTRICAL EQUIPMENT
We actually have one of AMERICA'S LARGEST STOCKS
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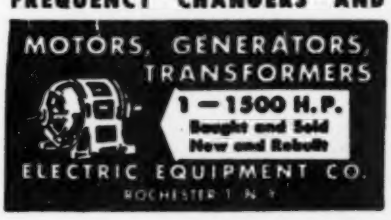

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Commission salesman or agent. Sell Timber-Lox waterproofing and wood stabilizer to furniture and all wood fabricating trade. Excellent potential, good arrangement. Give all details in letter to G. E. NOLTE,

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SAWDUST SOIL IMPROVER

The period for receiving license applications for manufacturing and sales rights for the sawdust soil improver process, Fersolin, has been extended from the previously announced deadline of May 10 to July 1, 1951, the Committee on Hardwood Research Administration has advised the association secretaries of hardwood producers.

This action was taken at the request of hardwood research committee members who reported to Carl A. Rishell, committee secretary, an unusually large number of inquiries from hardwood manufacturers about this new waste utilization process.

At a meeting of the committee last February 27, provision was made for generally acquainting the hardwood manufacturing industry with the process and offer was made to receive until May 10 applications for license to manufacture and sell Fersolin under pending patents in the U. S. and Canada. Applications covering 17 states have already been received.

Manufacturing facilities required are simple in comparison with most chemical utilization processes and capital equipment investment is comparatively low. Waste from any wood species, mixed or otherwise, dry or green can be used. Presence of bark in the waste makes no difference. It is believed plants of 10 tons daily capacity are commercially feasible. Marketing opportunities for the product appear to be quite promising.

In making the soil improver material the screened waste is dampened with a weak acid solution and then subjected to a heat treatment. The entire process takes about an hour. The converted sawdust may if necessary (depending upon soil and plant conditions) be further treated with an alkali to reduce the acidity. The product, a black granular dust, is spread over the soil and plowed in. It serves as a soil conditioner for increasing porosity reducing hardpan and retaining the correct amount of soil moisture.

A detailed prospectus covering the process and provisions for licensing are available to hardwood manufacturers from Carl A. Rishell, Secretary, Committee on Hardwood Research Administration, 1319 18th Street, N. W. Washington 6. D. C.

"I am a woman of few words," said the soon-rich dowager to her new maid. "If I beckon with my finger, I mean 'Come.'"

"I am a woman of few words, too," said the maid. "If I shake my head, I mean I ain't comin'."

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Ekstrom Carlson No. 448 MD, BB, Vertical Gang Borer, 48"x22" range
Yates S-7 6 ft. Hand Lever Stroke Sander
Mattison No. 115 Variety Sander
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Root Vertical Hydraulic Gang Borer
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New Union Conveyorized Edge Glue Spreader
Taylor Panel Flow Edge Glue Spreader

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American No. 9 Automatic Knife Grinder
New Hanchett Automatic Band Saw Grinder for 7" Blades

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Yates-American No. 213 Direct Motor Driven Glue Jointer
12" direct motor driven ball bearing Hand Jointer

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Mattison 42" No. 57-D motor drive ball bearing
Mattison 36" No. 55-C motor drive ball bearing
Large quantity Mattison Lathe Heads with carriers and knives

MORTISERS

Wysong & Miles No. 288 direct motor driven 6-spindle mortiser
Wysong & Miles No. 286 Hinge Seat Mortiser
Greenlee No. 227 direct motor driven single spindle mortiser

MOULDERS

Yates-American 4" Type C-69 Electric Moulder
Yates-American 4" Type C-88 Electric Moulder
Mattison 6" No. 276 Electric Moulder
Yates 10" Type C-55 Electric Moulder
Practically New 12" Vonnegut Electric Moulder

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New Crescent P-24 Direct Motor Dr. with Grinder
Used Crescent P-24 Direct Motor Driven
Whitney Ball Bearing Direct Motor Driven
Yates-American 24" No. 1 Direct Motor Driven Ball Bearing Facer with Four Post Herzog Feed

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SANDERS

Solem 43" S-3M Motor Driven Ball Bearing Endless Bed Sander
Yates-American 43" No. 431 Direct Motor Driven Endless Bed Sander
Yates-American 61" S-23 Roll Feed Direct Motor Driven Ball Bearing Three Drum Sander
Mattison No. 124 Automatic Stroke Sander
Pearson Waterfall Sander
Nash No. 10 Automatic Turning Sander
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DeWalt Model GE 10 HP Practically New
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Yates-American No. 2 Direct Motor Driven Ball Bearing Double Cut-Off Saw
Beach Direct Motor Driven Ball Bearing Double Cut-Off Saw

RIP SAWS

Mattison No. 207 Direct Motor Driven Ball Bearing Glue Joint Rip Saw
Yates-American G-7 Direct Motor Driven Ball Bearing Chain Feed Rip Saw
American No. 15 Ball Bearing Chain Feed Rip Saw

ROUTERS

Porter No. 600 Electric Router

MITRE SAWS

Yates Type F-2 Direct Motor Driven Ball Bearing
Tannewitz Direct Motor Driven Tilting Table Variety Saw
Bell No. 12 Direct Motor Driven Ball Bearing Double Miter Saw

SHAPERS

New Crescent Type S-2 Single Spindle Shaper
Whitney No. 139 Double Spindle Electric Shaper
Whitney No. 251 Double Spindle Electric Shaper
Whitney No. 234 Double Spindle Electric Shaper
Whitney No. 393 Automatic Single Spindle Shaper
Onsrud W-125 Double Spindle Automatic Shaper

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Fay & Egan No. 505 Direct Motor Driven Ball Bearing Single End

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Francis 96" by 36" Hydraulic Veneer Press with 100 pairs of clamps and irons
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MISCELLANEOUS

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American 12" Wedge Bed BB
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New Britain, No. 2, chain
New Britain, No. 7, chain
Northfield, chain mortiser, motor driven Hydraulic feed
Northfield chisel mortiser, motor driven
Wallace chisel mortiser, motor driven

MOULDERS

Mattison No. 224 9" all electric, hopper fd.
Yates American No. C55—18" all electric
SA Woods No. 107 12" 5 heads, belt driven
SA Woods No. 131 9", belt driven
American No. 20 7", belt driven
American C4A 6"x4" B.D.

PLANERS

American Saw Mill 24" single DMD BB
Northfield 24" single, MD motor fd. No. 5
American 24" single, belt drive

PLANER & MATCHER

Fay & Egan No. 156 20"x8" 6 hds., belt dr.

SANDERS

Peerless 9" 14" and 20" horizontal
Peerless 9" 14" Vertical
Wysong & Miles, Oakley, Mattison belt
Fay & Egan 42" 2 drum endless bed MD BB No. 399
HB Smith 42" 3 drum, endless bed, MD BB No. 401

SAWS - BANDSAWS

Tannewitz 36" DMD 32" under guide
American No. 4 40" rip and resaw
36" American, Tannewitz, Crescent, Oliver
27" Crescent Band Saw
Yates V40 48" BB Angle Bandsaw
Northfield BB & DMD 20" to 36"

SAWS - CUT OFF

Porter C43 5 HP DMD BB
Beach 5 HP DMD BB
Multiplex 5 HP DMD BB
Unipoint 3 HP DMD BB
Wallace 2 HP DMD BB
DeWalt 1 to 5 HP DMD BB
Beach multiple, cut off 6' DMD BB
Jenkins No. 105A double cut off and mitre saw, 96"x60" MD motor feed BB

SAWS - RIP SAWS

Yates American G77 Str. Line DMD BB motor feed
Sinker Davis, self feed gang, BB belt dr.
Beach Self feed gang, DMD 15 HP BB

SAWS - VARIETY

American No. 10 tilt top belt drive
BM Root tilt top belt drive
Mereen Johnson, double tilt arbor, DMD BB with carriage
American No. 8 tilt arbor DMD BB rolling table
50 other makes to choose from

SHAPERS

L. Powers single BB - MD
Union Single spindle BB MMBD
Defiance Double spindle, DMD with tilting and sliding heads
Whitney 2 sp. automatic BB MD No. 105
Yates N2 BB MD

TENONERS

Crescent single end, 5 head individual motor drive, BB
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American No. 1 Single end belt driven

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Electric Carpenter 5 machine combination all ball bearing motor driven.
NEW—Taylor caterpillar clamp carrier 60 sections, 6½' centers 32" wide clamps, air rotation.
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American dowel machine BB
Covel Hanchett Band Re-saw grinder MD
Greenlee & Amer. Door clamps, Sash clamps
Smith 24" facing planer, MD, BB power feed

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Gardner Rix 4½x4½ 3 hp motor drive
Curtis 3x3½ 1 hp motor drive
Chicago pneumatic 12x10 horizontal 60 hp V belted motor drive
Scott model W80 2 stage 15 hp mtr drive
Curtis 6x6 duplex belt drive no motor

BAND SAWS

Colladay 36" ball brg. 3 hp motor drive
Yates-American 16" ½ hp motor drive
Root 36" bab.brg. 5 hp V belt motor drive

BAND RESAW

Mereen-Johnson No. 195 comb. rip & resaw 42" wheels 5" blade ball brg. 25 hp V belt dr. with compensator and several blades

CLAMPS

Bell No. 70 4x8 air clamp
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Two Handy No. 53 12"x36"x54" cabinet clamps
Two Handy No. 53 24"x30"x54" cabinet clamps
Black Bros. CR4 pneumatic revolv. 48x30x72 maximum x12" min. with mtr. driven screw
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Bar clamps, carriage clamps, screw clamps

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Four Moore forced draft cross circulation automatic controls 20x35 compartments

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Two Clarage bal. brg. 37" intake 60 hp V.B.D.
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Complete 10" system ball brg. fan 5 hp dr.
American self contained unit ¾ hp dr.
American self contained unit 1½ hp dr.

GLUE ROOM EQUIPMENT

Thermex electronic edge gluer, 42x84
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Black Bros. 44" No. 22D glue spreader
Black Bros. 20" No. 22D glue spreader
Francis 25" double spreader, fluted rolls electric heating units 1 hp motor drive
Several hand feed spreaders
Zimmerman 5 gal. electric glue converter
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JOINTERS

Colladay 16" bal. brg. dmd & Billstrom feeder
Fay & Egan 12" bal. brg. direct mtr. drive
Moak 12" conv. bal. brg. V belt motor drive

LATHES

Yates No. 74 42" bal. brg. mtr. dr. 120" of heads

MORTISERS

New Britain chain 7½ hp belt motor drive
Air operated compound table
Yates-American K25 3 hp foot operated

MOULDERS

Mattison No. 229 10" elec. ball brg. square heads jointers & 33 KW frequency changer

MONORAIL

Cleveland 12" T rail about 200 ft with 90 degree curve & American 3 ton hoist

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Buss No. 88-30" double ball brg. mtr. dr. with all extras

PRESSES

Lawton 200 ton 36x96 7-opening hot plate hydraulic press
Lawton 40x42 100 ton single opening hydraulic press 10" to 24" daylight
Alliance 36"x40" sgl. opening hydraulic
Two small Frames sgl. open. Hydraulic Presses
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Handy No. 821 84" plywood bending press with electric heating elements
Handy No. 804A 40" round corner bend. press

RELISHER

Greenlee No. 605 relisher belted mtr. drive

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Onsrud No. W240 2-speed electric router
Ekstrom-Carlson No. 434 2 sp. elect. router
Several air & electric portable routers
Kelly electric stair router

SANDERS

Several hand block belt—not modern
Yates No. 401 55" belted motor drive

SAWS—Cutoff

Bell No. 12A 90" Double end miter & cutoff
Three DeWalt 3 hp radial saws
Walker-Turner 3 hp radial saw
Two Monarch Uni-Point radial saws 5 hp

SAWS—Rip

Diehl No. 75 straight line rip saw, nearly new
Bates ball brg. gang rip saw, 12" arbor
7½ hp V belt drive, nearly new

SAWS—Variety

Two Whitney 5 hp tilt arbor lg. table
Two Tannewitz 5 hp tilt arbor lg. table

SHAPERS

Onsrud No. W250 2-speed with overarm
Whitney 2 spindle ball brg. hinged mot. dr.

TENONERS

Jenkins No. 90 78x48 hopper feed & jump dado
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200 factory trucks 24x48; 30x60 & 30x72 plain bearings & wheels and roller bearings and rubber tired wheels
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Crescent 36-in. tilting frame
American 42" V-belt M.D.
Tannewitz 42" M.D.

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American 36" Ball Bearing direct M.D.
Buss 36" Bab. Brg. V-belt Motor Dr.
Newman No. 117 circular resaw BB M.D.
McDonough 62" Vertical Band Resaw
Mershon 48" Twin Band Rip B.B.

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Rogers Single Spindle Horizontal Borer
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Greenlee 6-ft. No. 370 Hor. gang. M.D.
Greenlee No. 356 single-spdl. vert. d.m.d.
Greenlee 36-in. No. 369 vert. gang. 8-spd. m.d.
Greenlee 363-6 spindle Univ. Vertical M.D.
Root "B-M" 16-spindle, sluster hd., motor dr.

BLOWERS AND FANS
American No. 80E with 40 h.p. coupled motor
G. R. No. 50 ball bearing 40 h.p. motor
Sturtevant No. 25-30-35 Mill Exhausters, BB

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Taylor 6-ft. 12 sec. wheel type clamp carrier
Black Bros. 10" 50-sec. power feed
Greenlee No. 599 frame and furniture clamp
Buss Drawer Clamp 24"x12" jaws

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Rogers 38" cup wheel auto. knife grinder
Hanchett No. 608 lap gr. b.d. max. cap. 8" wide
Covel-Hanchett No. 325 thin knife grinder

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Smith-Colladay-Jones Superior M.D.
Porter 6" V-belt motor drive
Mattison Greenlee D-618 continuous feed

JOINTERS
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Meyers continuous feed V-Belt M.D.
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Mattison No. 214 copying lathe
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Yates-American T3 Auto. Shaping, M.D

MORTISERS
Greenlee No. 226 Hollow Chisel, belt drive
New Britain Nos. 2 and 7 chain, motor drive

MOULDERS
Yates No. C3 4" fast feed, belt drive
Yates No. 108 9" belt drive coupled motor
Rowley-Hermance 6-in. coupled motor drive
Newman 4"x4" all Electric
Yates No. C-89 10"x4" all Electric
Vonnegut 12"x4" with Freq. Changer

PLANERS
Yates No. 136 20" dr. hd. m.d.
Porter No. 401 24" round head BB D.M.D.
Whitney P-8 36" sn. heads V-Belt Mtr. Dr.
Buss 28", 30" & 36" single B.B. M.D.
Buss 6A 36" 6 roll single D.M.D.
Yates B2 36" double M.D.

ROUTERS
Carter Type TR-Porter No. 600-Ekstrom-Carlson
Porter No. 622 Vertical Ball Brg. M.D.

SHAPERS
Onsrud W 125 Automatic 84" cap.
Whitney No. 134 double-spindle dir. M.D.
Amer. No. 20 dbl.-spdl. dir. M.D. Freq. Chgr.
Advance double-spindle, ball bearing, mtr. dr.
American dbl. spindle, belted m.d.
Oliver No. 288T Double Spdl. short belted M.D.
Whitney No. 282 Sgl. D.M.D. 50"x40" table

SANDERS
Yates 401-49" roll feed, M.D.
Solem No. 370 43" 2 drum End. Bed
Smith No. 400 49" 3 drum End. Bed
Mattison No. 124 8-ft. Auto. Stroke M.D.
Yates No. 413 42" 2-drum, End Bed M.D.
Buss 2-spindle vertical, oscillating belt drive
Wysong & Miles No. 164 universal belt, m.d.
Yates No. 421, 49-in. 6 drum with motors

MITRE SAWS
American No. 1 tilt table V-Belt M.D.
Union Tilting Arbor direct M.D.
Tannewitz tilt table motor on arbor
Wallace 8" tilting arbor 1 HP 1 ph. motor
Crescent No. 10 roller tilt-table direct m.d.
American Dbl. revolving Arbor 5 HP Belted mtr.

CUT OFF SAWS
De Walt Radial Arm, 5 HP motor
Multiplex A50 Radial Arm, 2 HP
Jenkins No. 97, 108"x48" Double End chain feed with copes, direct M.D.
Fay & Egan No. 306 butting saw
Greenlee No. 451 auto. cut-off and dado
Buss double cabinet type, motor-drive

RIP SAWS
Yates G2 Chain Feed Motor Drive
Yates G77 chain-feed, D.M.D.
Smith No. 335A self-feed, belt or motor drive
Mattison No. 207 chain-feed, motor-drive

TENONERS
Greenlee 535 Saw Tenoner, dir. M.D.
Greenlee No. 534, Single end with cut-off, no copes, dir. m.d.
Smith No. 225CE Single-end with copes

This is only a partial list—send or call your inquiries

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One of the oldest and finest Lumber Mills in Detroit had an opportunity to sell their real estate holdings to a large metal working company at a fancy price, so they decided to retire from business. All their equipment is now for sale—some for immediate delivery, other for delivery in July and August, as they have some orders that must first be completed. All this equipment can now be shown you in operation. Come and make inspection. FIRST COME, FIRST SERVED.

BAND RESAWS

McDonough 44" BB-25 h.p. mtr.
Mershon "Standard" 54" bb-30 h.p. mtr.

BORERS

Fay & Egan Sgl.-Spdl. Vert. bb-2 h.p. mtr.
Crescent Comb. Vert. & Horiz. bb-3 h.p. mtr.
American Sgl.-Spdl. Horiz. bb-3 h.p. mtr.
Bell No. 5B Stile & Rail, bb-3 h.p. mtr.

CLAMPS—Glue Room Eqpt.

Greenlee No. 602 Sash Clamp
Bell No. 11 Power Dr. Clamp, bb-5 h.p. mtr.
Greenlee No. 599 Frame Clamp cap. 12x12 to 54x72"
Bell No. 7 Gluer & Dowel Driver, bb-1 h.p. mtr. to hdl. ½" & ⅝" dowels
Taylor Glue Clamp Wheel, 12 Ft.
Frances No. 23 Veneer Press
Handy No. 359 Steel Veneer Press
Frances 28" Sgl. Roll Glue Sprdr. 3 h.p. mtr.
Frances Cold Glue Mixer, 3 h.p. mtr.
International Elec. Glue Pot 2 qt.
1 Pr. Frances Trestle Clamps
1 Lot Assorted Clamps

SMALL ELECTRICAL TOOLS

1 Skilsander
1¼" Electric Drill
1⅜" Electric Drill
6½" Electric Drills
3 Black & Decker Screw Drivers
1 Kelley Elec. Hand Router with Stair Framing Plate
3-2 Qt. Electric Glue Pots

SHAVING EXHAUSTER

Sturtevant 32" Shv.-Exh.-Fan, DMD by 20 h.p. mtr.
2 Sturtevant No. 70 Shv.-Exh. DMD by 35 h.p. mtr.
1 Sturtevant No. 70 Shv.-Exh. Fan, DMD by 50 h.p. mtr.
1 Shavings Belt Conveyor
1 Shavings Baler Steam Oper. Ram
Blow pipes, cyclones, etc.

FILING ROOM EQUIPMENT

Woods No. 227 Side-Hd. Grinder, bb-BMD by 3 h.p. mtr.
Band Resaw Grinder,
Tension Rolls, power driven
Band Resaw Retoother
Brazing Clamp
Saw Gummer, bb
Saw Leveling Block
5 Ft. Steel Str.-Edg. Resaw
1 Saw Anvil 6"x10"x7"
1 Saw Anvil 10"x12"x6"
1 Balancing Scale
1 Gas Furnace & Torch
1 Gas Stove & Soderinq Iron Stove
6 Dbl.-End Emery Grinders, Bench Type, BMD
1 Dbl.-End Emery Elec. Grinder, Pdstl. type, 1 h.p. mtr.

JOINTER

Porter Style "C" 16" Jointer, BB rd. safety-hd. 5 h.p. mtr.
Buss 16" Hand Jointer, rd.-safety hd. 7½ h.p. mtr.
Smith No. 87A 16" Jointer, rd. safety hr. BMD, 3 h.p. mtr.
Fay & Egan Continuous Feed Glue Jointer

LUMBER & COAL HANDLING EQUIPMENT

200 Factory Trucks
150 Lumber Buggies
Ross No. 70 Lumber Carrier
Ross No. 18 HT Fork Lift Truck
Barber Greene, under Car Coal Unloader, 5 h.p. mtr.
1 Trowbridge Coal Conveyor

METAL WORKING EQPT.

20" Post Drill
14" Drill Press
20" Drill Press
22" Cincinnati Drill
Logan No. 820 Lathe, BMD 1/3 h.p. mtr.
South Bend Lathe 18"
Steptoe 20" Metal Shaper
"Precision" Arc Welder
Weaver Auto Hoist
Weaver Forcing Press
Marvel No. 2 Hack Saw
American Forge Blower
Blacksmith Cone
Blacksmith Anvil (3)
Thin Wall Benders 1 Ea. ½, ¾ and 1½"
One Lot of Machinist Vises

MOULDERS & STICKERS

Smith Sgl. Hd. Sash Sticker, bb-3 h.p. mtr.
Hall & Brown Sgl. Hd. Sash Sticker, 7½ h.p. mtr.

J. LEE HACKETT CO.

Machinery & Equipment
DETROIT LUMBER COMPANY

H. B. Smith No. 141 3-Hd. Sash Sticker, 7½ h.p. mtr.
Jenkins No. 60 2-Hd. Door Sticker, 10 h.p. mtr.
XL Mould Master BB-Mldr. 2 h.p. mtr.
Hermance No. 50 8" Mldr. 20 h.p. mtr. coupled
Hermance No. 50 10" Mldr. 20 h.p. mtr.
Hermance No. 50 12" Mldr. 30 h.p. mtr.
Woods No. 132B BB 10" 5-Hds. Mldr. 40 h.p. mtr.

MORTISERS

New Britain No. 2 Chain Saw Mortisers, 3 h.p. mtr.
Amer. Hollow Chisel Mortiser, 3 h.p. mtr.
Fay & Egan Horiz. Hollow Chisel Mortiser & Sash Relisher, 1 h.p. mtr.
Enterprise Pocket Cutter & Pully Mortiser, 5 h.p. mtr.
Smith & Phillips Pocket Pulley Mach. 3 h.p. mtr.

MOTORS

All Motors AC 220 volt, 60 cycle, 3 ph.
4—5 HP, 1800 RPM
2—7½ HP, 1800 RPM
1—15 HP, 1200 RPM
1—15 HP, 1800 RPM
2—30 HP, 900 RPM
1—50 HP, 1200 RPM

PLANERS

Buss No. 4 26"x7" Sgl. Planer, BB 4-knife rd. cutterhead 10 h.p. mtr.
Berlin No. 187 20x10" Dbl. Planer, 35 h.p. mtr.
Fay & Egan No. 666 BB 15"x8" Planer & Matcher, 60 h.p. mtr.
Newman No. 512 16" 6-roll BB Planer & Matcher, with Dble. Profile 60 h.p. mtr.

SANDERS

Model S-3 State Oscillating Spdl., m.d.
Belt Sander, BMD 2 h.p. mtr.
Berlin No. 401 61" 3-Drum Roll Feed Sander, spiral drums, bb-30 h.p. mtr.
Yates No. 431 67" 3-Drum End. Bed, spiral drums 10 h.p. mtr. on each drum

SASH MACHINES

Sash Coping Mach ¾ h.p. mtr.
Fay & Egan Sash Slotter, 5 h.p. mtr.
New Britain Window Frame Dado Machine, 5 h.p. mtr.
Bell No. 7 Dowel Driver & Gluer 1 h.p. mtr.
Milbury Pocket Cutter & Pulley Mortiser, with mtrs.
See other headings for Sash Clamps, Tenoners, Mortisers, etc.

SHAPERS

Porter No. 105 Sgl. Spdl. BB Shaper m-d.
Powers bb dbl. Spdl.Shaper, 5 h.p. mtr.
Buss No. 8 BB Dbl. Spdl., 5 h.p. motor

TENONERS

Hayes Sgl.End Tenoner, Copes, Cut-off Saw, 5 h.p. mtr.
Smith bb Sgl.End Tenoner, Copes, Cut-off Saw, 5 h.p. mtr.
Greenlee No. 530 BB Sgl. End Tenoner, Copes, Cut-off Saw, 5 h.p. mtr.

SAWS

Band and Jig Saws

Sidney 36" Band Saw, bb, 3 h.p. mtr.
Jones Superior Jig Saw, 1½ h.p. mtr.

Cut-Off Saws

12-Swing Saws with or without mtrs. gauge rod and stops
2-Multiplex No. 60 Radial Arm Saws, 5 h.p. mtrs.
Green Undercut Swing, 3 h.p. mtr.
Fay & Egan Roller Table, wood frame, 2 h.p. mtr.
Beach No. 802 Tilting Arbor, BB, 5 h.p. mtr. 8' Roller Extensions ea. side of saw, will cut stock 50" wide in front of saw.

Variety Mitre Saws

Rowley Hermance, 5 h.p. mtr.
Dodds Tilting Table, 3 h.p. mtr.
2—Tannewitz Univ. Type B Revolving Arbor 3 h.p. mtr.
Smith 347A Comb. Saw & Dado

Self Feed Rip Saws

Smith 335, 10 h.p. mtr.
3 Greenlee 426G bb-10 h.p. mtr.
Yates G2 Chain Feed, 15 h.p. mtr.
Mattison 202 Chain Feed, 15 h.p. mtr.

MISCELLANEOUS

Mercury Chain Saw
Fox No. 3 Mitre Cutter
Spray Booth 15'x12'x8', lights, spray gun, etc.
Air Compressor with tank & mtr.
2—Belt Lacers
Belt Vulcanizer
Lot Leather Belting
3—International Job Clocks
250 Steel Lockers
100' 7" "I" Beam
Lot Line Shafting
Tire Shrinker
Wright 1 Ton Electric Hoist
Plumbers Gasoline Stove
Lot Fire Extinguishers
Moisture Meter
Lot Resaw Blade 4", 5", 6" Width
Lot Matcher Heads, moulding & Shaper Knives, etc.
Paper Bailer
Platform Scales
Steel Safe
Battery Charger
Etc., Etc., Etc.

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Andrew 8' Horizontal
No. 95 Andrew Horizontal
No. 369 Greenlee Multiple Spindle 6' Vertical

√CLAMPS
Taylor 30-Section 8' Caterpillar Type
Billstrom 39-Section 8' Caterpillar Type
No. 96 Handy Case Clamp
Handy Revolving Carrier
Palmer 6" Wheel Type Clamp Carrier
New Handy No. 54 and No. 55 Chair Clamps

√DOVETAILERS
Dodds 20-Spindle

√JOINTERS
Dennis Veneer Jointer
Hand Jointers 12" to 24"
Chain Feed—Meyers, Fay & Egan, Diehl, Jenkins
Jenkins Saw Type Veneer, ball bearing, 6' and 8'

√LATHES
No. 55C Mattison Ball Bearing, Motor Driven Automatic Turning
No. 57D Mattison 40" Lathe

√MOULDERS
American 4" Babbitt Bearing, Belt Dr.
Fay & Egan 7" Plain Bearing, Four-Hd.
Woods 8" Plain Bearing, Belt Drive

√PLANERS
Buss 4L—30" Planer
No. 177 Yates 30" Roughing, Double ~~[illegible]~~ 30", 36", 44" Single; 30" Double
Whitney 30" Single

√SANDERS
No. 10 Nash Six-Spindle; No. 25 Ten-Spindle
No. 171 Wysong & Miles Moulding
Yates Three-Drum Endless Bed 43" and 30" coupled motor
Smith Ball Bearing, Motor Drive Three-Drum

√SAWS
No. 202 Mattison Chain Feed Rip
No. 207 Mattison Chain Feed Rip
No. 336-E Mershon Chain Feed Rip
Clement 54" Band Resaw
Bell No. 12C and No. 12A
6' and 7' Buss, and Hall & Brown Hand Feed Double Cut-Off
No. 312 Yates 44" Band Rip, Chain Feed
Wilkin-Challoner Double Cut-Off
Beach 80" Double Cut-Off

√SHAPERS
No. 200 Porter Single Spindle
Buss and Whitney Double Spindle
Whitney Automatic
Onsrud WA-50S Automatic, sliding spindle

√TENONERS
Fay & Egan Single End
Eaglesfield Saw Type, ball bearing

√MISCELLANEOUS
No. 928 Covel-Hanchett Automatic Circular Saw Sharpener
No. 300 Francis Flat Plate Edge Gluer (New)
6, 8 and 12-Plate Merritt Redriers
No. 7 and No. 8 Bell Dowel Drivers and Gluers, motor drive
Francis 30"x72" Hydraulic Veneer Press
Salstrom 24-Spindle Multiple Carver
Minnesota 12-Spindle Carver
Doig Nailing Machine
Wysong & Miles Electric Multiple Horizontal Mortiser
Merritt 65" Veneer Clipper
Onsrud S-175 Automatic Shaping Attachment for Onsrud W-240 Router
Sheridan 36" Veneer Clipper

SPECIALS FOR THIS MONTH
Practically New Bell No. 100 Borer
Buss 4L—30" Single Planer

MONICAL MACHINERY COMPANY

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MAKE YOUR CHOICE FROM THIS LIST OF TOP QUALITY MACHINERY . . .

BAND RESAWS
McDonough 54" Ballbearing, Dir. Mtr. Dr. (new)

BAND SAWS
Superior 42", ballbearing, motor driven
American No. B-38, 38", Ball bearing, Mtr. Dr.

BORERS
Andrews 60" 6-Spindle, Horiz., DMD Power Feed
Valley City, 2-spdl., adj. radial, motor driven
American 2-spdl., adj., radial, motor driven
Superior 2 Spindle Adjustable Radial, BB, D.M.D.
Superior 3-Spdle., Adjust. Horiz. Motor Driven
Wysong & Miles No. 283B, Sgl. Spdl. Vert., B.B. D.M.D. (Like New)

CLAMPS—ASSEMBLY
Bell Chair Assembly, Air Operated (like new)
Bell 4-way Hi-Jaw, Air Operated.
Bell 4-way Frame & Chair Back, Air Operated.
Bell No. 95, Revolving Case Clamp, Air Operated.

CLAMP CARRIERS
Handy 18-sec., 5 ft. wide, 38" clamps per sec.

DOVETAILERS
Dodds 25 Spindle, motor driven, spiral gears.

DOWEL MACHINERY
Bell No. 4-A capacity ¼"-2", M.D., B.B.
Bell No. 8 Auto. Gluer & Dowel Dr., Dir. M.D.
Nash No. 4 Dowel Rod Sander, motor driven

JOINTERS
Fay & Egan No. 217, Continuous Chain Feed
Jenkins No. 3CD, Continuous Chain Feed, B.B., D.M.D.
American 12", Round Head, motor driven
Superior 12", Round Head, motor driven

JIG SAWS
American, self-contained
Oliver No. 173 Self-contained, D.M.D.
Superior, Self-contained, motor driven

MORTISERS
Greenlee No. 228 Vert., Hollow Chisel, M.D.

MOULDERS
American No. 1, 4", 4-Side, Motor Driven
American No. 1, 6", 4-Side, Motor Driven
American No. 35, 7", 4-Side, All Electric, B.B.
Mattison No. 262, 9", 4-Side All Electric B.B.

PLANERS
Superior 28" Single, Motor Driven
Buss 4-L, 30", Single Cabinet, Direct Motor Driven, Ball bearing
Buss No. 4, 30" sgl. cabinet, M.D.
American No. 112, 30" single, motor driven

ROUTERS
Porter No. 582, 2-spdl., B.B., D.M.D.

SANDERS
American No. 2, 24" Disc and Oscillating Spdl.
American No. 5 Drum Sander, D.M.D.
Mattison No. 138 Hand Block Belt, Motor Driven
Mattison No. 172, Oscillating Edge Belt, Mtr. Dr.
Nash No. 4 Round Stock and Dowel Sander
Yates No. 431, 49", 3-Drum Endless Bed, Direct Motor Driven
Yates No. 430, Hand Block Belt, Motor Driven

SHAPERS
Onsrud W125 72" Automatic, multiple stations, B.B., direct motor driven, with frequency changer
Buss, Sgl. Spdl., Hi-Speed D.M.D., B.B.

SAWS—CUT-OFF
Buss Double End, Motor Driven
Diehl No. 724, Floor Type, Straight Line, Ball bearing, Direct Motor Driven
Racine Floor Type—motor driven
Fay & Egan Double End, Motor Driven.
Irvington No. 20, Floor Type, Straight line, Ball bearing, Direct Motor Driven
Yates-American, Floor Type, Ball bearing, Direct Motor Driven

SAWS—RIP
American No. 15 Chain Feed, motor driven
American No. 40 Chain Feed, Ballbearing, D.M.D.
Defiance No. 21-D Chain Feed—motor driven
Diehl No. 75, Straight Line, Chain Feed, Ball bearing, Direct Motor Driven
Mattison No. 207, Chain Feed, Direct Motor Dr.

SAWS—VARIETY
American No. 1, Tilting Table, Motor Driven
Dodds Tilting Table, Motor Driven
Pettingell, Tilt Arbor, Roller Table, M.D.

TENONERS
American, Single End, Tenon Heads, M.D.
McKnight No. 71C Chair Back Tenoner, M.D.
Townley Single End, Tenon heads, lower cope, cut off saw, motor driven

VENEER MACHINERY
Black Bros. No. 115 36"x84" Electric Press, Direct Motor Driven
Dennis Continuous Feed Veneer Jointer, mtr. driven
Dennis Veneer Taping Machine Motor Driven
Jenkins-Falls Veneer Jointer, B.B., motor driven

MISCELLANEOUS
Autonailer, Floor Type, Direct Motor Driven, B.B.
Bell No. 13 Dovetail Gluer.
Bell No. 56 Hand Feed Chucking Machine, Ball-bearing Direct Motor Driven
Black No. 5, 12" Edge Glue Spreader, Electrically Heated, Direct Motor Driven
Fay & Egan No. 253, Automatic Knife Grinder, 30"
Sturtevant 36" B.B. Blower M.D.
Sturdevant 60" Exhaust Fan, Motor Driven

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FADER WOODWORKING EQUIPMENT QUALITY

A. L. FADER & COMPANY

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A VOLUNTARY LIQUIDATION

PUBLIC AUCTION

THURSDAY, JUNE 28, 1951
Starting 10 A.M. (C.D.S.T.)
On the Premises

BY ORDER OF THE BOARD OF DIRECTORS

WOODWORKING MACHINERY SHOP & OFFICE EQUIPMENT AND MANUFACTURING RIGHTS

OF THE

G. I. SELLERS & SONS COMPANY

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One of America's Finest and Most Modern Rough Cutting Departments . . . . . Consisting of:

Root Electric Lumber Lift
2 Porter Hydracut Saws & Conveyor
Oliver Straitoplane Planer
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2 Diehl No. 75 Self-Feed Rip Saws
2 Diehl No. 55 Self-Feed Rip Saws
Matthews Defects Return Conveyor
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GREENLEE No. 545 Double-End Tenoner
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American 20"
Crescent 20" Ball Br. New
Lehman 30" Bab. Br. $125.00
Wright 30"
Crescent 36" Ball Br. D.M.D.
Fay & Egan No. 345 36"
Fay & Egan 48" Belt or Motor Dr.
Fay & Egan No. 155 30" Ball Br. M.D.
Moak 36" B. B. Band Saws (2)

BAND RESAWS
Yates V-54" Vert. Band Resaw
7" Blades, 40 hp motor.

BORING MACHINES: Fay & Egan No. 190 Sgl. Spl. Vert.
Andrews 32" Dbl. Col.
Andrews 42" Sgl. Col.
Root Sgl. Spl. Motor on Spl.
Dennis Sgl. Vert. Universal
Greenlee Post Borer

BOX MAKERS MACHINERY:
Beach Box Maker Carriage Cut Off
Hall & Brown Box Board Matcher
Luther Box Board Matcher

CLAMP CARRIER: Handy 12 ft. 6 wheel 18 leaves 6—31" clamps each 95% New

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American Comb. Sash & Door Clamp
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Lancaster Pneumatic Chair Clamp
Handy No. 100 Bed Clamp
Black Bros. Chain Clamps
American Sash Clamp
3000 Spring Clamps No. 2 and No. 3

DADO SAWS: Fay & Egan No. 5 C.O. and Dado
American No. 1 Dado Saw Auto.
Hall & Brown No. 134 Comb. C. O. & Dado Saw, Power Feed

CUT OFF SAWS: Oliver No. 94-D St. Line C.O. Saw with Roller Tables 95% New
Greenlee No. 453 Auto. Railway C.O. 7" cap.
Greenlee No. 456 Auto. Railway C.O. 12" cap.
Comet Timber C. O. 10 h.p. 44" blade
Beach Carriage C.O. Saw
Swing Cut Off Saws (several)
Fay & Egan Table C. O. Saw

DOWEL MACHINES: Fay & Egan No. 406 Rod Machine

JIG SAWS: Oliver No. 173-B Ball Br. Self Contained Motor built in. New at Bargain Price
Beach No. 1 Tilting Table Scroll Saw

JOINTERS:
Cordesman 9" Rd. Hd. Jointer
12" 4 knife Rd. Hd. Jointer
16" Fay & Egan No. 316 B.B. M.D.
16" American B.B. 4 knife Motor Dr.
Smith 16" 4 knife Jointer
Fay & Egan 20" rd. hd. Jointer
Fay & Egan No. 316 20" Rd. Hd. M.D.
Northfield (Late) 12" B.B. Motor on Hd.
Fay & Egan 24" No. 115 Belt or Motor Dr.
Moak 12" B. B. Jointer M. D.

LATHE: Oliver 12"x5 ft. Sgl. Ph. Motor Headstock 24" sw. 7 ft. Iron Bed Pattern w/Hand Fd. Carr. M.D.
Wood Lathe Sets 12" to 24" swing

MORTISERS:
New Britain No. 4 Chain with H. C. Attach.
New Britain No. 7 Chain, Compound Table M.D.
New Britain No. 1 Chain Mortiser
Wysong & Miles No. 134 H. C. Auto. Feed
Colladay Vert. H. C. Motor on spdl. B.B.
American No. 20 H.C. Comp. Table M.D.
American H C. Horizontal Auto. Feed
Crescent Hollow Chisel Mortiser

MOULDERS:
American No. 26-A 12"
American No. 3 Heavy 6" 4 side
Fay & Egan No. 207 7" 4 side
Hermance No. 50 8" 4 side Bab.
Hermance 10" 4 side
Fay & Egan No. 184 12" 4 side
Fay & Egan 10" 4 s.

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Grammes 4 track Cigar Box Nailer
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Berlin No. 177 30"x18" $750.00
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Crescent No. 224 24"x6" Feed M.D.
Fay & Egan No. 2 24"x6"
American No. 1 20"x6"
L. Power 24"x6" Motor coupled Head
Powermatic 12"x4" M.D.

RADIAL SAWS:
NEW MULTIPLEX RADIAL SAWS IN STOCK:
No. 20-A ½ hp. single ph.
No. 30-A ¾ hp. single ph.
No. 40-A 1½ hp. single ph.
No. 50-A 5 hp., 3 ph.

RIP SAWS:
Falls No. 103 St. Line B. B. 15 hp. motor
Falls No. 103 St. Line B. B. Belt Dr.
Bel-Saw Gang Self Feed

ROUTERS:
Kelley Elect. Stair Router 3 ph.
Cincinnati Elect. Stair Router
Hunter Elect. Stair Router $100.00
Duro Elect. Floor Type
Portable 1 hp. and 2 hp. New

SASH COPERS:
American Foot Power Sash Coper
Electric Bench Type Sash Coper

SAW FILING MACHINERY:
Foley Band Saw Filer
Wardwell Band Saw Filer
Covel Resaw 4" Tension Rolls
Power Band Saw Setter

SAW TABLES
Oliver No. 80 D.M.D.
Yates-Amer. No. 6 Variety Motor Arbor
Crescent No. 2, 3, and 5 Universal

SANDERS:
Amer-Col. 42" 3 dr.
American No. 15 24" single dr. Hand Feed
American No. 15 30" single dr. Hand Feed
Mattison No. 115 Variety Belt Sander
Wysong & Miles No. 171 Belt Sander
Yates Amer. Comb. 15" disc & Drum M.D.
Wysong & Miles No. 303 Comb. 26" Disc

SHAPERS
Crescent S-2 B.B. M.D.
Fay & Egan No. 265 Dbl.
Double Spindle B. B. Motors on spindle, 3600 or 7200 rpm

TENONERS
Crescent T-3 Electric Tenoner
Powermatic B. B. Tenoner

TIMBER PLANER:
Yates P-12 12"x20" 4 side

VENEER CLAMPS
5—38" 3 screws
4—29" 2 screws

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AT ITS BEST!

At Left, a partial view of our warehouse looking toward the rear, showing only about one-third of our stock.

Owing to our very large stock changing almost daily, we are omitting our stock list. We have about 350 new and used machines. Tell us exactly what you want, and advise phase, cycle and voltage of your current

organization skilled in the rebuilding of all types of woodworking equipment. Every machine as it enters the plant is carefully checked and inspected by men whose knowledge and experience make them familiar with every detail . . . just as doctors make a thorough diagnosis before a remedy is prescribed. All parts are then removed . . . in fact the machine is completely stripped to the frame. Every box is rebabbitted . . . every spindle ground accurately to size . . . drums, cylinders, heads, and pulleys are balanced . . . knives are ground and balanced . . . every shaft or stud showing signs of wear is replaced.

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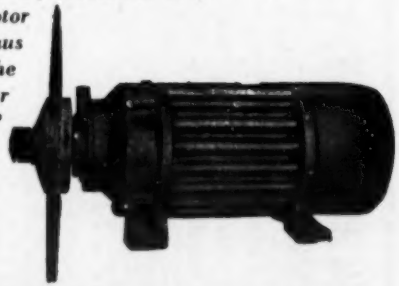
MOTORS Totally enclosed, dust proof, fan cooled, ball bearing saw arbor motors, 3600 r.p.m. From 1 h.p. to 15 h.p. Measures only 3¼" from center of motor shaft to flatted top. Thus facilitating the use of the smallest possible diameter saw blade. (2, 3 & 5 HP motors available for quick shipment.)



A large stock of Standard Frame 3 phase motors and controls from 1 HP to 125 HP.

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WE HAVE THE VALUES Y

VERTICAL BORING MACHINES
Greenlee No. 356 single spindle, ballbearing, M-I-H.
Oliver No. 272 single spindle, ballbearing, M-I-H.
Root type "GMB" singe spindle, ballbearing, M-I-H.
Wysong & Miles No. 283-B single spindle, B.B., two-speed Motor-in-Head
Yates-American No. U-31 single spindle, B.B., two-speed Motor-in-Head

HORIZONTAL BORING MACHINES
McKnight No. 4-CM 8-spdl Comb. Horiz. & Vert. Boring and Sawing machine, all M.D.
Andrew 72" capacity, four or more spindles, belt or MD
Bell No. 5-B Stile and Rail Borer, 4 spindles, M.D.
Greenlee No. 368 Twenty-inch cap., ballbearing, M.D.
Moak two spdle. Radial Horiz., 10" spdle. sprd., M.D.
Oliver No. 71 with two dble. spdle. mtr. dr. boring hds.

CLAMPS
Bell No. 11 Power Door Clamp, 5 H.P., 220/440v. Mtr.
Hayes Power Door Clamp 4'x8' 6" capacity, M.D.
Lancaster No. 100-C two-way air operated frame clamp
Taylor 12' cap., 12-section glue clamp carrier, 96 clamps

DOVETAILERS
Dodds 15-12-10 spdle, spiral gears, motor driven
Wysong & Miles No. 290 automatic prod., B.B., M.D.

DOWEL MACHINES
Bell No. 50A Dowel Rod Machine, 7½ H.P. built-in M.
Bell No. 4A Dowel Rod Machine, Belt or Mtr. Drive
Bell No. 3 Dowel cutting-off and pointing machine
Bell No. 8 Dowel Gluer and driver, Motor driven
Bell No. 7 Dowel Gluer & Driver for Sash & Door work
Hawker No. 5 Dowel Rod Machine, 5" capacity, M.D.

EXHAUST FANS
Clarage 75" No. 33 Single, Roller Brgs., 75 H.P., V-belt motor drive
Sturtevant No. 70 Single Slow Spd., 50 H.P., D.M.D.
Sturtevant 100" Dble slow spd., 2-spd. mtr., chain dr.

FREQUENCY CHANGERS
Burke 24-KVA 180 cy. secondary, 440v., 60 cy. Primary, Direct Motor Driven
G.E. 25-KW 120 cy. secondary, dual wound, 220/440v., Direct Motor Driven
G.E. 25-KW 120 cy. sec., 440v., 60 cy. primary, 15 H.P. motor
G.E. 33-KW 100 cy. sec., with 20 H.P. 1200 RPM Driving motor
G.E. 40-KW 120 cy. sec., with Woods 20 H.P. 1200 RPM Driving motor
Louis Allis 60-KW 100 cy. sec., with L.A. 35 H.P. Driving motor
Electro Dynamic 80-KVA, sec. 120 cy., with 50 H.P. Driving motor

FILING AND GRINDING ROOM EQUIPMENT
Mattison No. 231 Elec. Knife Grinder, 1½ H.P. M-I-H
Woods No. 227 Side Head Grinder, 1½ H.P. M-I-H
Mummert-Dixon No. 475 Tool Grinder, with knife grinding attachment
Samuel Rogers 84" knife grinder, belt driven
Wardwell Mod. K-5 Band Saw Filer, on ped., M.D.

GLUE JOINTERS
Diehl No. 660 Cont. Chain Fd., B.B., D.M.D.
Mattison D-616 Cont. Chain Fd., B.B., D.M.D.
Jenkins No. 3-C Cont. Chain Fd., B.B., with motors

HAND JOINTERS
Fay-Egan 12" No. 506 B.B., Round Head, D.M.D.
American 16" No. 1, B.B., Round Head, V-belt M.D.
Moak 16" B.B., Round Head, D.M.D.
Porter 16" Style "C" B.B., Round Head, D.M.D.

JOINTER FEEDERS
Porter 24" B.B., 6-knife round hd., D.M.D., with Herzog 4-post type auto. feeder, M.D.
Smith 24" B.B., round head, with feed, M.D.
Smith 36" B.B., round head, with feeder, M.D.

LATHES
Mattison No. 55-C Automatic Turning Lathe, B.B.
Mattison No. 55-C Automatic Turning Lathe, 15 H.P. Motor
Mattison No. 210 Automatic Copying Lathe, Motor Drive
Mattison T-Slot Hexagon Lathe Heads, and Knife Holders

MORTISERS
New Britain No. 2 Chain Saw Mortiser, M.D.
Greenlee No. 228 Vert. Hollow Chisel Mortiser
Wysong & Miles No. 268 Horiz. 6-Spdl., 15 H.

MOULDERS
"X-L" Moldmatcher, 2"x4" cap., B.B., M.D.
Yates 4" No. C-3-A 4-Side B.B., belt driven
Hermance 8" No. 50 4-Side, Pl. Brg., w/20 H.
Woods 10" No. 132-B 5-Hd., B.B., Hopper Fd.
Hermance 10" No. 50 4-Side, Pl. Brg., w/25 H.
Hermance 12" 4-Side, Pl. Brg., w/30 H.P.

SINGLE PLANERS
American 24" No. 1½ B.B., Round Hd., D.M.
Buss 26" No. 4 B.B., Round Hd., 10 H.P. Mtr. Grinder
Whitney 30" No. 32, B.B., 25 H.P. mtr. dir. con.
Whitney 30" No. 32 B.B., 20 HP., mtr. dir. con.

DOUBLE PLANERS
American 30" No. 666 B.B., Round Heads, D.M.
Buss 30" No. 88 B.B., Round Hds. D.M.D.
Whitney 36" No. 24 B.B., Round Heads, M.
Whitney 40" No. 33 Heavy Duty, B.B., M.D.

PLANERS AND MATCHERS
Newman 16" No. 512 Six Roll B.B., Dbl. Profile
Fay & Egan 15" No. 666 Jr. B.B., w/ 60 H.P. RPM Mtr.

ELECTRIC ROUTERS
Ekstrom-C. No. 156 High spd., B.B., 1½ H.P.
Onsrud W-265 High Spd., B.B., 1½ H.P. m
Onsrud W-240 Heavy Duty, B.B., 5 H.P. m
Porter No. 610 Heavy Duty, B.B., 5 H.P. motor.
Porter No. 600 B.B., High Speed, 2 H.P. motor.
Porter No. 500 B.B., 7½ H.P. M-I-H.
Onsrud No. A-4D Sgle. Arm Router, M.D.

BELT SANDERS
Wysong & Miles No. 603 Auto. Stroke, 8' Cap.,
Wysong & Miles No. 270 Oscillating Edge Belt
Wysong & Miles No. 275 Hand block, B.B., D.M.
Yates No. 430 Hand block, 6' tble, 2 H.P. V-belt
American No. 11 Horiz. Flat Bed, 14" wide belt,
Peerless No. 6 Vert., B.B., 9" wide belt, D.M.D
Mattison No. 115 Variety belt sander, self-con., motor.

MISCELLANEOUS SANDERS
Nash No. 25-72" cap., 10 spdles, D.M.D.
Nash No. 25-48" cap., 10 spdles., D.M.D.
Nash No. 10-72" cap., 6 spdles, belted M.D.
Oliver 15" single disc, self-cont. ½ H.P. motor
Fischer 36" Double disc, Iron Frame, with motor
Pearson Model "A" Moulding Sander, 1 H.P. mot
Vonnegut Model SEM Dble. End Spdle. Sander, M

DRUM SANDERS
Yates (Berlin) 31" cap., 6 drum, D.M.D.
Solem 49" No. SE74 4-drum Endless Bed., B.B.,
Solem 73" No. 430 Triple drum endless bed, B.B.,
Yates 67" No. 431 Tri. drum endless bed, 10 H.P.
Yates 31" No. 431 Tri. drum endless bed, V-belt
Smith 30" Triple Drum, Endless Bed, B.B., D.M.
Solem 42" No. 370 2-drum endless bed, D.M.D.
Yates 42" No. 413 2-drum Endless Bed, Belt or M
Yates 73" No. 401 triple drum roll feed, M.D.
Yates 61" No. 401 triple drum roll feed, 30 H.P.
American-Columbia 61" No. 9 triple drum roll D.M.D.

SASH AND DOOR MACHINES
Bell No. 5-B Stile & Rail Borer, 4 spdles., M.
Bell No. 11 Power door clamp, 5 H.P. M.D.

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yes power door clamp, 4'x8' 6" cap., M.D.
eenlee No. 509 frame clamp, cap. 12"x12" to 54"x72".
eenlee No. 602 Sash clamp, foot operated
ll No. 7 gluer and dowel driver, for sash and doors, M.D.
w Britain No. 2 Chain saw mortisers, self-cont. M.D.
terprise (Millbury) pocket cutter, 2 H.P. motor
terprise (Millbury pulley mortiser, 5 H.P. motor
ith & Phillips pocket & pulley machine 2 H.P. mtr.
w Britain window frame Dado machine, 5 H.P. mtr.
ukins No. 60 Chain feed door sticker, T.&B. heads, with motor.
ll & Brown sash sticker, top head, w/7½ H.P. mtr.
ith sgle head sash sticker, w/3 H.P. motor
ith No. 141 sash sticker, top & bottom hds, 7½ H.P. motor
y & Egan Sash Slotter; Woodworkers Coping machine, M.D.

ND SAWS

y & Egan 36" No. 50 B.B., D.M.D.
dney "Famous" 36" B.B., with 5 H.P. motor
nerican 36" No. B-36, with 3 H.P. motor
nerican 42" Direct Motor Driven, 7½ H.P. motor
nes-Superior 42" with 5 H.P. V-belt M.D.

ND RESAWS

cDonough 44" Vertical, B.B., 25 H.P. V-belt Drive
ershon 54" "Standard" Vert. with 30 H.P. motor
rge assortment of blades for vertical and horizontal resaws.

T-OFF SAWS

nkins No. 97 Chain Fd. Dble Cut-off Saw, with Cope spindles, B.B., D.M.D.
cKnight No 4-CM Comb. Sawing & Boring, all elec.
cKnight No. 26-F Dble End sawing & boring machine, D.M.D.
ates-American Model G-44 Straight Line, B.B., 5 H.P. Motor-on-arbor
eston & Anderson No. 5 Swing cut-off Saws, B.B., 1 H.P. Motors
y & Egan No. 501-A Swing Saws, B.B., 5 H.P. Motor-on-arbor
eston & Anderson Model No. 55, B.B., with 5 H.P. Motor V-belt drive
rter 5' swing saw, B.B., 5 H.P. motor-on-arbor with roller tables
eWalt Radial arm saw with built-in ½ H.P. 110 volt single phase motor
reene Floor type undercut swing saw, with 3 H.P. mtr.

OR SCROLL SAWS

nes-Superior No. 46 Self-cont., w/1½ H.P. motor
y & Egan No. 6 Self-cont., w/2 H.P. mtr., V-belt dr.
merican Self-cont., Motor driven or belt driven

SAWS

attison No. 202 Chain feed, B.B., 15 H.P. M-O-A.
attison No. 205 Chain feed, B.B., 15 H.P., M-O-A.
ates Model No. G-2 Chain feed, B.B., 15 H.P. motor-on-bracket.
mith No. 335 self-feed Rip Saw, 10 H.P. motor
ates (Berlin) No. 257 Self-feed Rip Saw, with mtr.

RIETY SAWS

each No. 802 Tilting arbor, B.B., D.M.D., roller ext.
ay & Egan No. 500 Tilt tbl., B.B., 5 H.P. M-O-A
annewitz type "F" Tilting tbl., B.B., 5 H.P. V-belt M.D.
ates-American No. 1 w/hollow chisel mortising and boring attachment
annewitz Type "B" dble. arbor rip and cut-off saw, with motor

NGLE AND DOUBLE SPINDLE SHAPERS

orter No. 105 sgl. spdl., B.B., 3 H.P., mtr. at rear
ates-American "N-4" sgl. spdl., B.B., 5 H.P., mtr. at rear
dvance No. 122 Dbl. spdl., B.B., M.D.
American No. 30 Dbl. spdl., B.B., short belted M.D.
Greenlee No. 180 dbl. spdl., B.B., 7½ H.P. each spdl.
Smith Dbl. spdl., B.B., 4 H.P. mtr on each spdl.
Whitney No. 50A dble. 30" spdl. centers, 4 H.P. motor-on-spindles
Whitney No. 134 dbl., 24½" spdl. ctrs., 4 H.P. motor-on-spindles.
Whitney No. 156 dbl. spdl., adjustable tble sec., B.B., M.D.
Whitney No. 351 Heavy Duty Dble., 12½ H.P., B.B. motor on each spindle

AUTOMATIC SHAPERS

Onsrud W-124 Sgl. spdl., 72" Dia. tbl., 12½ H.P. MIH
Whitney No. 395 Dbl. spdl., 12½ H.P. mtr. on each spdl.

TENONERS

Greenlee No. 530 sgl. end., B.B., T.&B. copes, w/mtr.
Fay & Egan No. 2 Sgl. end., top & bottom copes w/7½ H.P. motor
American Automatic Blind slat tenoner, belt driven
McKnight No. 71C chair back tenoner, belt driven

VENEER AND PLYWOOD EQUIPMENT

H-P-M 72"x30" hydr. veneer press, w/2 plunger pump
Black Bros. Spar Presses, 6 sec., total length 330"
Merritt 100"x52", 10 plate veneer redrier, M.D.
Merritt 84"x54", 16-12-8 plate veneer rediers, M.D.
Francis sectional veneer presses (9) assorted sizes.
Francis No. 23 Iron & steel veneer press, 96"x24", 10 screws
Handy No. 359 all steel veneer press, 96"x30", 15 screws
Sheridan 36" Veneer Cutter and Jointer, with Motor
Dennis Veneer Taping Machine, Motor Driven

MISCELLANEOUS MACHINES

Doig 6 track closed back nailing machine, w/2 H.P. 220/440 volt motor
Food Machy. Co. 18-track type No. 187000 nailing machines, 2 H.P. motors
Food Machy. Co. 20-track type C-B-M Cheese box nailer, 2 H.P. motor
Morgan No. 2 box setting up machines, air power oper.
L. G. McKnight No. 1-E Saddle Seat Machine, with 10 H.P. Motor.
Sheboygan Saddle Seat Machine, w/10 H.P. 220/440 volt motor
Grob N-S-18 Contour band saw, M.D., w/butt welder
Wells type SM43 metal cutting band saw, self-cont. mtr.
Ross No. 18 HT Fork Lift Truck. Forks have 72" exten.
Ross No. 70 lumber carrier.
Walker Electric Lift or Hoist, 7500 lb. cap., grd. M.D.
Gardner-Denver 10"x12" horiz. Air com., 60 H.P. mtr.

MISCELLANEOUS FACTORY EQUIPMENT

Spray Booth, 15' wide x 12' deep x 8' high, with pressure tank, etc.
U.S. Double end buffing machine, floor type, with 5 H.P. built in motor
Van Dorn, Thor, Mall, U.S. elec. drills, ¼"-⅜"-½" cap.
Black & Decker and Van Dorn elec. screw drivers, 60 & 180 cycles
Wright one ton cap. elec. hoists, w/100' 8" I beam
Lumber buggies, frame 3'4"x5'; 2 wheels 36" dia, 3" face (150)
Factory Trucks, 4-wheel, assorted sizes (150)
Barber-Greene under car coal unloader, 5 H.P. M.D.
Trowbridge coal conveyor, 18" wide belt, 5 H.P. M.D.

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One Story Factory Building—45,000 sq. ft.
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Can Equip with modern woodworking machinery.
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Guaranteed Used Machinery

Band Saw, New Northfield 20" ball bearing
Borer, Door Stile, Wilkins-Challoner.
Boring Machine Oliver Vert. sgl. spdle. D.M.D.
Chucking Machine, Smith, 3 HP motor
Door Clamp, J.A. Fay & Co. 8x4"
Jointer, 24" Crescent, Belt Drive
Jointer 12" Hall & Brown with motor
Knife Grinder, auto. Rogers style F-32"
Lathe, Auto. Berlin with heads, B.D.
Lathe, Propeller Fahlin 10' motor drive with wood patterns and jigs
Lathe, Waymouth, Automatic
Mortiser, Crescent Hollow Chisel, New
Mortiser, hollow chisel No. 379 Fay & Egan
Moulder, Yates C-2-3"-4 side, belt drive
Moulder 12" American No. 505 babbitt bear. B.D.
Planer single Fay & Egan 24x6 with 5 HP single phase motor
Planer sgl. 16x6" Powermatic with 3 ph. motor used
Planer, New Powermatic 12x4" M.D.
Planer, single 16x6" Powermatic, New
Planer, single 24x6 Northfield No. 5, New
Planer, 12x4" Boice Crane No. 1022, New
Nailing Machine, Doig 72"—26 track open back with cleater
Nailing Machine, Doig 6 and 13 track, closed back
Radial Saw, Wilson floor model, 5 HP, 3/60/220
Router, Onsrud Radial Arm with frequency chngr.
Radial Saws, New Multiplex No. 20A-30A-40A and 40B, single phase, 110-220 volts
Sander, Crescent 18" Disc, New
Sander, Belt, Auto., Curtis 6'
Sander, Disc an dDrum, Fay & Egan
Sander, Nash auto. belt for Bowling Pins
Sander, Belt 8' Schimmel Reid Semi Auto.
Saw, 12" tilt arbor, Dara-James New
Saw croll, F&E elf Combined, 36" throat.
Saw Table, American No. 20, Double Arbor
Saw, Swing, H. & A. No. 5—10", New
Saw, Swing, H. & A. No. 25—14", New
Saw, Swing, H. & A. No. 55—16", New
Saw, Variety, Hall & Brown No. 131 with motor
Saw, Variety Sidney tilt table
Shaper, Crescent single spindle, M.D. New
Shaper dble. spindle Whitney with freq. changer
Shaper, Double Spindle Fay & Egan No. 265, belt drive with idler countershaft.
Shaper, American No. 20—with 2—5 HP motors
Tenoner, Hall & Brown No. 51 with copes
Tenoner, single end American No. 2½ with copes and cut-off and 7½ HP motor V-belt drive.
Tenoner, single end Hall & Brown No. 55 with copes and cut-off, belt drive
Tilting Arbor Saws, New Delta, Atlas & Darra-James

Send us your inquiries for machines not listed

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FOR SALE—MODERN MACHINERY, BOUGHT NEW IN '45 & '46

SAWS	Porter Hydra-Cut with 7½ h.p. motors and steel tables. Diehl No. 75 direct motor-driven chain-feed straight-line ripsaws. Tannewitz Type G3 and GH motor-driven ball-bearing bandsaws.
SHAPERS	Onsrud W-125 automatic, 84-in. capacity. Whitney No. 91 motor-driven double-spindle with belted motors. Whitney Nos. 139 and 134 motor-driven ball-bearing double-spindle.
ROUTERS	Onsrud W-240 high-speed electric router, 10,000 and 20,000-r.p.m. 5-h.p. motor.
BORERS	Indiana No. 27 Hydramatic trim and borer, motor-driven. Horizontal 2-spindle radial borers, motor-driven. Vertical single-spindle borers, motor-driven.
LATHES	Mattison No. 47D, 42-in. mtr.-driven ball-bearing auto. turning lathe
MISCELLANEOUS	Nash No. 25 auto. turning sander, 48-in. capacity; Mattison No. 138 motor-driven hand block belt sander; Wysong & Miles edge belt sander; Pearson Model A moulding sander; Vonnegut brush sander; Ekstrom-Carlson No. 18 motor-driven spindle sanders; Bell No. 8 dowel driver; Grob Bros. band saw welder; Foley band saw filer; Wells No. 3 power punch press; Atlas moss picker; Dewsbury 48-in. cotton picker; glue clamp carriers; flat plate and roll type spreaders.

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BORERS—Horizontal & Vertical
Greenlee No. 348—30" Mult. Horiz. Borer.
* Oliver No. 71 horizontal elec. borer
Andrew 48" & 72" Mult. Horiz. Borer
* Wysong & Miles No. 283-B Vert. Sgl. Spl. Borer.
* Greenlee No. 369—48" Vert. Mult. Borer.
Nash chair seat angular borer.
* McKnight 26F double end sawing and boring machine.

CLAMPING MACHINERY
Taylor 40 Section 78" Revolving Clamp Carrier.
Taylor 12-section glue wheel—high jaws
Handy No. 447 Air Operated, 2-Way End Clamp.
Lancaster 100C air-operated 2-way frame clamp.
Bell air-operated frame clamp.

GLUE MIXERS & SPREADERS
Francis M-7 (75 gallons) Veg. Glue Mixer.
Union 36" and 60" Dbl. Roll Resin Glue Spreaders.
Phenolite 52" Dbl. Roll Resin Glue Spreader.

JOINTERS
* Fay & Egan No. 506—12" hand jointer.
* Moak 16" Hand Jointer, DMD
* Yates-American No. 213 Glue Jointer.
Jenkins No. 3C glue jointer; b-b, v-belt drive.

LATHES
Mattison No. 55-C Auto. Turning Lathe, B.B.
Yates-American No. 74 Auto., turning lathe, b-b .
Ober No. 10 handle lathe.

MORTISERS
* Wysong & Miles No. 284 automatic hollow chisel mortiser.
Greenlee No. 228 Auto. Hollow Chisel Mortiser.
New Britain No. 7 chain saw mortiser.
Greenlee No. 207 Horizontal hollow chisel mortiser.

MOULDERS
* Yates-American C-88—4" electric moulder.
* Vonnegut 12" electric moulder.
Yates C3A-4" BB Belt Drive Moulder.

PLANERS—Facing
* Oliver 36" Straight-O-Plane.
* Porter 24" facing planer—Herzog feed.

PLANERS
* Crescent No. P24—24" single planer.
Yates B-3 20" single planer.
* Greenlee No. 110—30" 6-roll single planer.
* Whitney No. 24 30" Double Planer.
* Whitney No. 33—40" Heavy Duty Dbl. Planer.
* Yates B-2 36" double planer.
American No. 49—30" roughing planer.
Berlin No. 177—30" roughing planer.

PLANERS & MATCHERS
Fay & Egan No. 666—15" planer and matcher, b.b.
Triumph 24" Planer, Matcher, Moulder, B.B.
Sherman twin type end matchers.

ROUTERS
Porter No. 600 heavy duty elec. router.
Onsrud W-265 Electric Router.
* Onsrud A4D single arm radial router.

DRUM SANDERS
Yates No. 421—31"—42" 3-Dr. End. Bed Mtrzd.
* Solem S-3-M—72" 3-Drum Endless Bed Sander.
Berlin 31" Six Drum Sander.
American No. 9—61" 3-drum roll feed sander, mtrzd.

SANDERS—Belt & Miscellaneous
* Wysong & Miles No. 603 Automatic hydraulic stroke
* Oakley Models E and E-1 semi automatic double belt
Mattison No. 124 Auto. Stroke Sander.
Yates 430 hand block belt sander.
* Ekstrom-Carlson No. 18 Pneumatic drum Sander.
* Oliver 15" Single Disc Sander.
Nash No. 10 & No. 25 Auto. Spindle Sanders.
* Oakley Model H drawer sander.
Nash No. 53 round stock sander.

SAWS—Band Scroll & Resaws
* NEW Crescent 20" Band Scroll Saws.
* American B-36" band saw.
Porter No. 88—18" Band Saw.
Mershon 54" vertical band resaw.

SAWS—Cut-Off
* Porter 43-208 straight line cut-off saw.
* Bell No. 216 straight line cut-off saw.
* Yates-American No. 5 Swing Saw.
* DeWalt Radial Arm Saws—large selection.
* Jenkins No. 105-A Dbl. Cut-Off and Mitre Saws.
* Bell 12B double cut-off saw.

SAWS—Rip
* Yates-American Type G-67 Straight Line Ripsaw.
Mattison No. 207 straight line ripsaw.
Berlin No. 257 self-feed ripsaw.
Greenlee No. 426 self-feed ripsaw.

VARIETY SAWS
* Fay & Egan No. 500 tilt-table variety saw.
* Yates-American No. 1 Tilt Table Variety Saw.
Tannewitz tilt-table variety saw, b.b.
Baker Double Arbor Variety Saw, BB.

SHAPERS
NEW Crescent No. S-2 Single Spindle Shaper.
Porter No. 103 Single Spindle Shaper, BMD.
Porter No. 201 Double Spindle Shaper, BMD.
* Whitney No. 250 Double Spindle Shaper.
* Greenlee No. 186 Double Spindle Shaper.
* Whitney No. 351 double spindle, 12½ HP motors
* Whitney No. 393 Automatic Single Spindle Shaper
* Onsrud No. 124 automatic single spindle shaper.
* Whitney No. 395 automatic double spindle shaper.

TENONERS
Greenlee No. 531 single end tenoner.
H. B. Smith Single End Tenoner.
Fay & Egan No. 2 Single End Tenoner.
Wilkin-Challoner No. 50 Double End Tenoner, BB.
* Wilkin-Challoner No. 60 - 84" double end tenoner

VENEER EQUIPMENT
Seybold 60" and 74" veneer cutters.
Francis 30"x72" Hyd. Veneer Presses.
Merritt 84x54—8—10—12 Plate Redriers.
Pyrco (Fritz) Tapeless Splicer.
Large quantity of 36 and 38" "I" Beams.

MISCELLANEOUS MACHINES
* Jenkins No. 65 sash sticker.
Food Machinery Co. Model AC-2 boxmaker.
NEW Hanchett No. 133 Auto. Band Resaw Sharpener

This is only a partial list. If the machine you want is not shown, write us.

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MODERN MACHINERY—BARGAIN PRICES!

Moak 12" Direct Motor Driven Ball Bearing Hand Jointer

Hermance 8" Four Side Moulder, plain bearings, square heads, belt driven

Hermance No. 60—6" Ball Bearing Moulder, vee belt motor driven, square heads

Yates C-88 — 8"x4" Electric B.B. Moulder

Yates-American S7 Direct Motor Driven Ball Bearing Hand Lever Stroke Sander

Yates-American No. 26A — 10" Ball Bearing Moulder, b-d

Greenlee No. 426-G Motor Driven Gang Ripsaw, cpld. mtr. dr.

Porter No. 300CM Motor Driven Ball Bearing 24" Facing Planer

Porter No. 612 High Speed Electric Router with 2 h.p. motor

Vonnegut Motor Driven Ball Brg., Brush Backed Sander, nearly new

20" Motor Driven (Peerless Type) Horizontal Belt Sanders, plain bearing, vee belt motor driven

Mattison No. 244 Direct Motor Driven Straight Line Cut Off Saw, w/Steel tables

Diehl No. 75 Direct Motor Driven Ball Bearing Straight Line Ripsaw

Tannewitz Type GH and G3—36" Direct Motor Driven Bearing Band Saw

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American No. 1 Single Reversible
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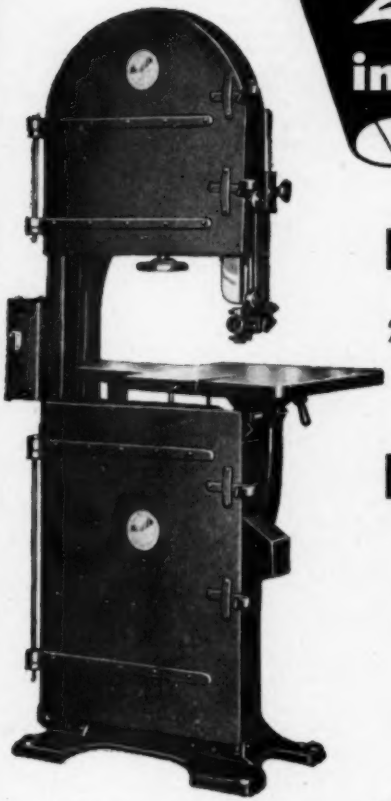

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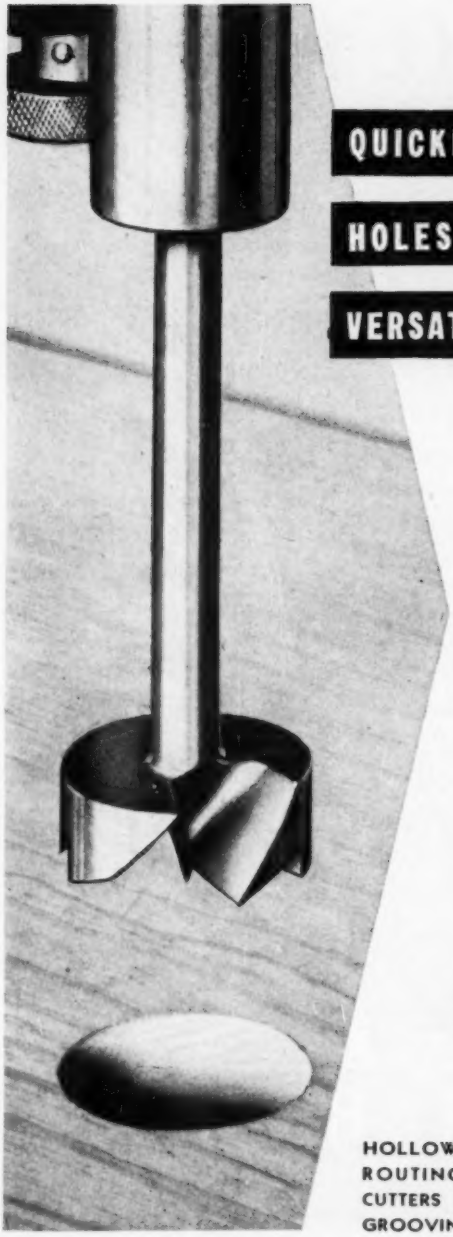

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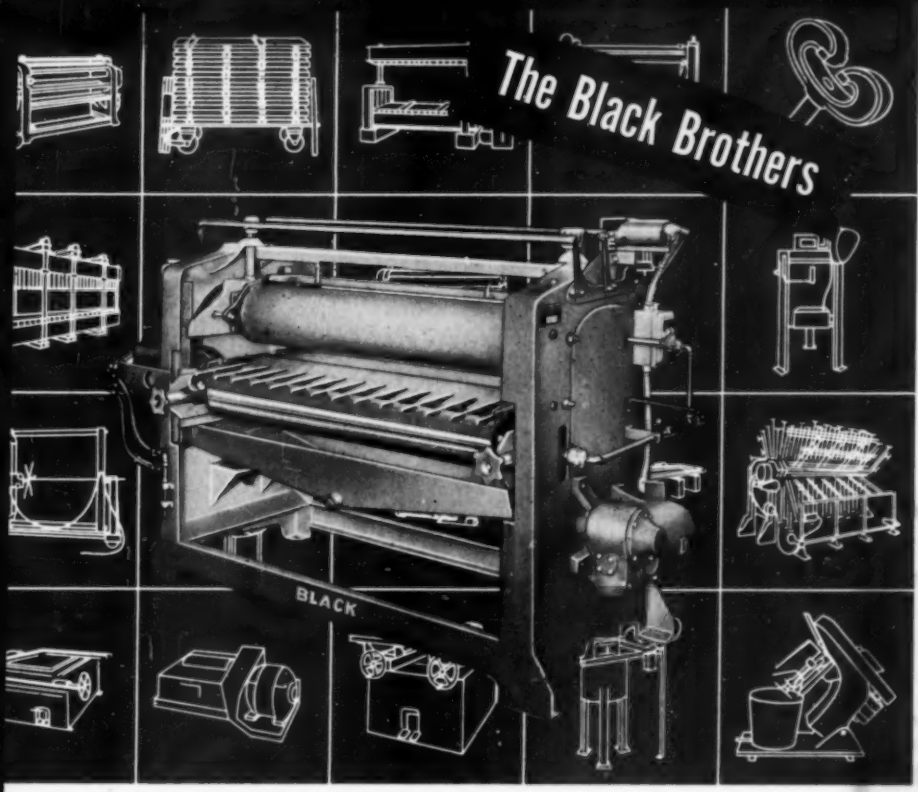

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